

THE IRON AGE

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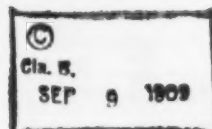
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49 CLIFF STREET

NEW YORK

THE IRON AGE



New York, Thursday, September 9, 1909.

The Cincinnati High Speed Drilling and Tapping Machine.

The high speed drilling and tapping machine herewith illustrated has been designed by the Cincinnati-Bickford Tool Company, Cincinnati, Ohio, to meet the demand for a high speed and high power machine, for the handling of high speed twist drills; also providing a slow speed for tapping with a quick return for withdrawing the tap. Fig. 1 shows the machine equipped with gear box drive,

continuous engagement, although a handle is provided to disengage it when it is not to be used. The lever for manipulating the back gear extends down on the left and near the front of the machine, where it is convenient to the operator. This lever, when brought to a neutral position, stops the spindle, and has been found a valuable and desirable arrangement.

On the machines equipped with gear box drive, the gear box is placed at the left, the base being L shaped, at which point the operator is able to make changes of speed without leaving his position at the front. Eight

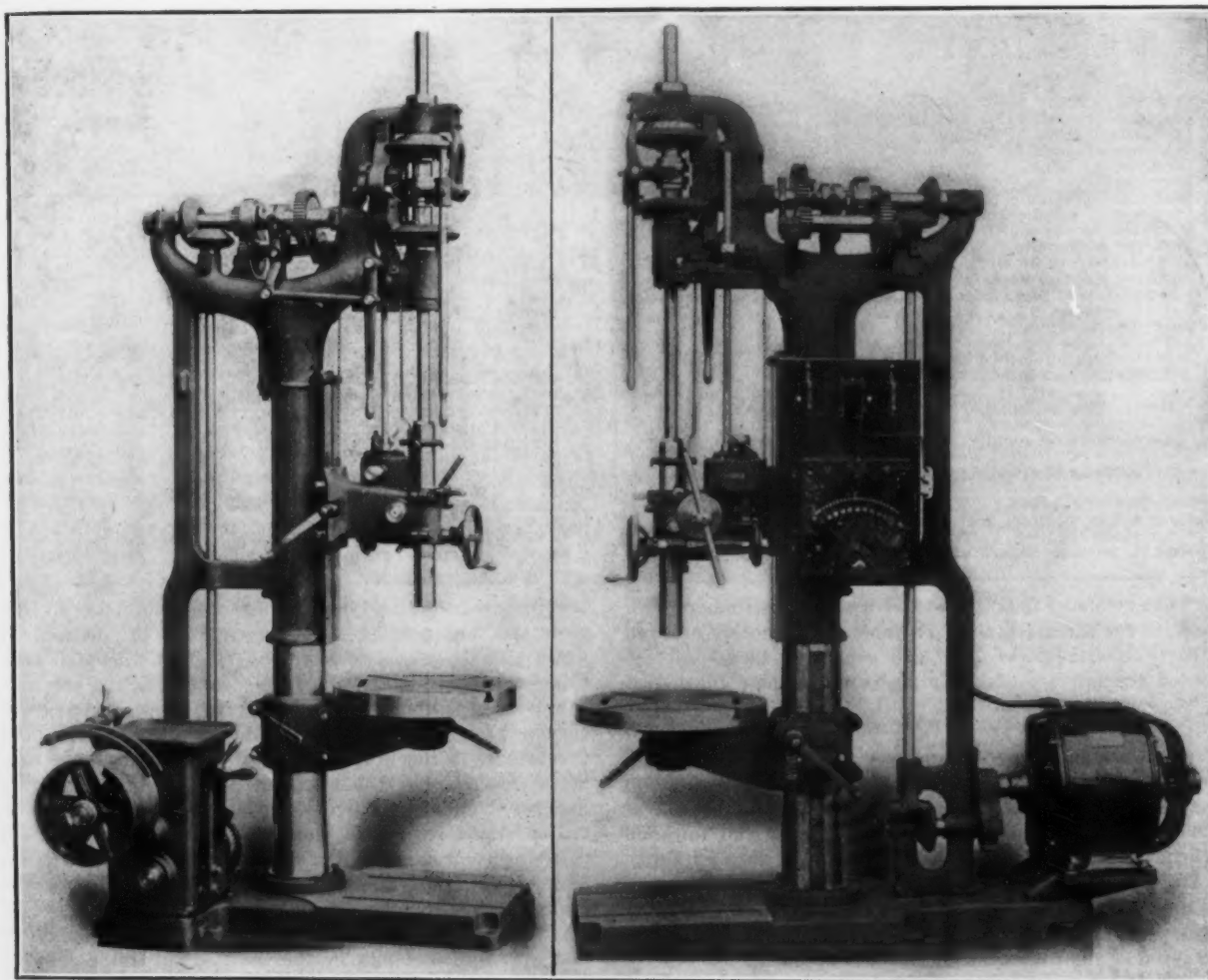


Fig. 1.—Shaft Driven Type.

Fig. 2.—Motor Driven Type.

Two Forms of the New High Speed Drilling and Tapping Machine Built by the Cincinnati-Bickford Tool Company, Cincinnati, Ohio.

and Fig. 2 with variable speed motor drive. The machine is heavy and powerful, with great strength in the table and table arm, to withstand the severe pressure due to high speed drilling and tapping. The table is well reinforced and is of massive construction, and has an increased bearing on the arm, which is hand scraped, insuring perfect alignment. Either a round, square or compound table is furnished with the machine, as desired. The head is counterbalanced, and vertically adjustable on the column. The spindle is made of high carbon crucible steel, provided with ball bearings and jam nuts for adjustment, and an automatic stop so that a number of holes may be drilled to a fixed depth.

The patent positive geared feed box is located on the sliding head, and is convenient to the operator. It provides six feeds, 0.006, 0.009, 0.013, 0.018, 0.027 and 0.039 in. per revolution of the spindle, any one of which can be used with any speed of the spindle. The friction back gear, shown at the top of the machine, can be left in

speeds are obtained through this gear box, and with the use of the back gear 16 different spindle speeds are available. It is stated that the time consumed in making any change of speed is not more than three or four seconds. There are no frictions in the gear box, but its construction is simple and substantial. A convenient detachable tool tray is fitted to it.

In the variable speed motor driven machine the motor takes the place of the gear box; otherwise the drive is the same. The motor is mounted on the base of the machine at the rear, and the controller on the side of the column on a board with the main switch and fuses. This machine has 18 different speeds, giving, in connection with the back gear, 36-spindle speeds. Any one of these speeds can be obtained without the operator leaving his position at the front of the machine. With either the motor or gear box drive correct spindle speeds for 70 ft. cutting speed per minute are provided for drilling, and a slow speed through the use of the back gear is fur-

nished for tapping. When a tap has reached the desired depth the reverse is accomplished by the tapping attachment lever, releasing the tap at a slow speed, when it can be withdrawn four times as fast as when going forward. The company's patent geared tapping attachment has now been used for some years, and has proved its value on a drilling or tapping machine. The machine can be furnished without the attachment if desired.

An index plate is attached to the gear box, and indicates the positions for the levers when drilling or boring different sizes of holes from $\frac{1}{2}$ to 7 in. diameter, and also indicates the number of revolutions (38 to 534 per minute) at which the drill is driven when handling high speed drills and cutters at 70 ft. cutting speed per minute. The company's high speed attachment is desirable for the drilling of small holes, and can be used in connection with this machine.

The following table gives dimensions and specifications of the different sizes of the machines built:

Size of machine.	24"	28"	32"	36"	42"	24-36"
Hight of drill, regular machine.....	7' 5 $\frac{1}{2}$ "	8' 0"	8' 5"	8' 11 $\frac{1}{2}$ "	9' 3"	7' 5 $\frac{1}{2}$ "
Hight of drill, tapping machine.....	8' 3 $\frac{1}{2}$ "	8' 11"	9' 4 $\frac{1}{2}$ "	9' 11 $\frac{1}{2}$ "	10' 3 $\frac{1}{2}$ "	8' 8 $\frac{1}{2}$ "
Drills to center of.....	25"	29"	33"	37"	43"	38"
Distance between base and spindle.....	48"	52"	54"	57"	58"	48"
Distance between table and spindle.....	35 $\frac{1}{2}$ "	37 $\frac{1}{2}$ "	38 $\frac{1}{2}$ "	39 $\frac{1}{2}$ "	38 $\frac{1}{2}$ "	35 $\frac{1}{2}$ "
Traverse of table on column.....	19 $\frac{1}{2}$ "	19 $\frac{1}{2}$ "	18 $\frac{1}{2}$ "	18 $\frac{1}{2}$ "	19"	19 $\frac{1}{2}$ "
Traverse of head on column.....	21 $\frac{1}{2}$ "	22 $\frac{1}{2}$ "	24 $\frac{1}{2}$ "	26 $\frac{1}{2}$ "	24 $\frac{1}{2}$ "	21 $\frac{1}{2}$ "
Diameter of table.....	22"	25"	28"	32"	36"	28"
Diameter of column.....	7"	7 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	9 $\frac{1}{2}$ "	10"	7"
Diameter of spindle in sleeve.....	1 $\frac{1}{16}$ "	1 $\frac{1}{16}$ "	1 $\frac{1}{16}$ "	2 $\frac{1}{16}$ "	2 $\frac{1}{16}$ "	1 $\frac{1}{16}$ "
Diameter of spindle above sleeve.....	1 $\frac{1}{16}$ "	1 $\frac{1}{16}$ "	1 $\frac{1}{16}$ "	2 $\frac{1}{16}$ "	2 $\frac{1}{16}$ "	1 $\frac{1}{16}$ "
Diameter of sleeve.....	2 $\frac{1}{8}$ "	2 $\frac{1}{8}$ "	3 $\frac{1}{8}$ "	3 $\frac{1}{8}$ "	3 $\frac{1}{8}$ "	2 $\frac{1}{8}$ "
Traverse of spindle.....	11"	12"	13"	14 $\frac{1}{2}$ "	16"	11"
Spindle bored to fit Morse Taper number.....	4	4	4	5	5	4
Ratio of spindle, bevel gears.....	1 $\frac{1}{2}$ to 1	1 $\frac{1}{2}$ to 1	1 $\frac{1}{2}$ to 1	1 $\frac{1}{2}$ to 1	1 $\frac{1}{2}$ to 1	1 $\frac{1}{2}$ to 1
Positive geared feed, in thousandths of an inch per revolution of spindle.....	6, 9, 13	6, 9, 13	6, 9, 13	7, 11, 16	7, 11, 16	6, 9, 13
Gear box machines:	18, 27&39	18, 27&39	18, 27&39	22, 34&49	22, 34&49	18, 27&39
Size of tight and loose pulleys.....	12 x 3 $\frac{3}{4}$ "	14 x 4 $\frac{1}{4}$ "	14 x 4 $\frac{1}{4}$ "	16 x 4 $\frac{1}{4}$ "	16 x 4 $\frac{1}{4}$ "	12 x 3 $\frac{3}{4}$ "
Revolutions of intake shaft per minute.....	427	427	427	343	343	427
Revolutions of spindle, without back gears.....	534, 428	534, 428	534, 428	428, 356	428, 356	534, 428
Revolutions of spindle, with lower back gears.....	356, 306	356, 306	356, 306	306, 267	306, 267	356, 306
Revolutions of spindle, with upper back gears.....	267, 214	267, 214	267, 214	214, 178	214, 178	267, 214
Revolutions of spindle, with both back gears.....	178, 153	178, 153	178, 153	153, 134	153, 134	178, 153
Morsepower required.....	134, 107	134, 107	134, 107	107, 89	107, 89	134, 107
Floor space required, gear box machine.....	89, 76	89, 76	89, 76	76, 67	76, 67	89, 76
Floor space required, variable speed motor machine.....	67, 53	67, 53	67, 53	53, 45	53, 45	67, 53
Weight, pounds, about.....	45, 38	45, 38	45, 38	38, 33	38, 33	45, 38
	3	5	5	7 $\frac{1}{2}$	7 $\frac{1}{2}$	3
	43 $\frac{1}{2}$ x 45"	49 x 51"	50 $\frac{1}{2}$ x 55 $\frac{1}{2}$ "	55 x 61 $\frac{1}{2}$ "	56 $\frac{1}{2}$ x 66"	43 $\frac{1}{2}$ x 51"
	21 $\frac{1}{2}$ x 74"	24 $\frac{1}{2}$ x 82"	26 $\frac{1}{2}$ x 86"	29 x 92"	30 x 104"	21 $\frac{1}{2}$ x 80"
	2,700	3,500	4,000	5,200	6,100	2,800

The company is prepared to furnish its customers with motors for the machines. Variable speed motors of from 475 to 1900 rev. per min. are generally used. All exposed gearing is thoroughly protected by gear guards.

The August export business of the International Harvester Company is stated to have been considerably in excess of that of August a year ago, and this branch of the business promises to increase during the autumn. In the month of October the company will ship an entire cargo of harvesting machinery to the Black Sea, which will be two months earlier than any similar export in past years. This movement indicates that business in Russia is improving, and that developments in Siberia are making rapid progress. Siberia is the largest foreign customer on the books of the company.

A New English Type Wire Stranding Machine.

The high speed seven reel wire stranding machine illustrated in Fig. 1, is designed by its builder, the New England Butt Company, Providence, R. I., for making plain seven wire strand, or initial strand and laying it into wire rope up to $\frac{1}{2}$ in. diameter. For making plain strand the machine can be used for the initial step in the manufacture of concentric copper cable. It is the English type of machine, as distinguished from the planetary type, in that both cradle and reels remain stationary while the wire is wound around the core by guides in a revolving frame made up of a series of wheels with pipe separators.

The machine proper, which is better shown in Fig. 2, carries pressed steel reels 16 in. diameter by 9 $\frac{1}{2}$ in. long, which are supported in the cradles hung in the center of

the rotary frame and heavily counterweighted. As the reels are thus held in a constantly vertical position, no twist is given the wire any more than in the planetary type, and consequently the wires stranded in the machine can be laid up into cable, no strain having been given them. The separating tubes, three in each bay, hold frame wheels the proper distance apart, and three long bolts through the tubes fasten all into one revolving member. The frame wheels revolve on adjustable rollers of ample size, with ring oiling bearings. The path of the wire from each reel is through the forward trunnion of the cradle and thence through an opening in the trunnion of the rotating frame wheel and passes over small grooved sheaves mounted on the separating tubes and through openings in the succeeding frame wheels, following along by the side of the rods connecting the wheels to the front of the machine, at which point they

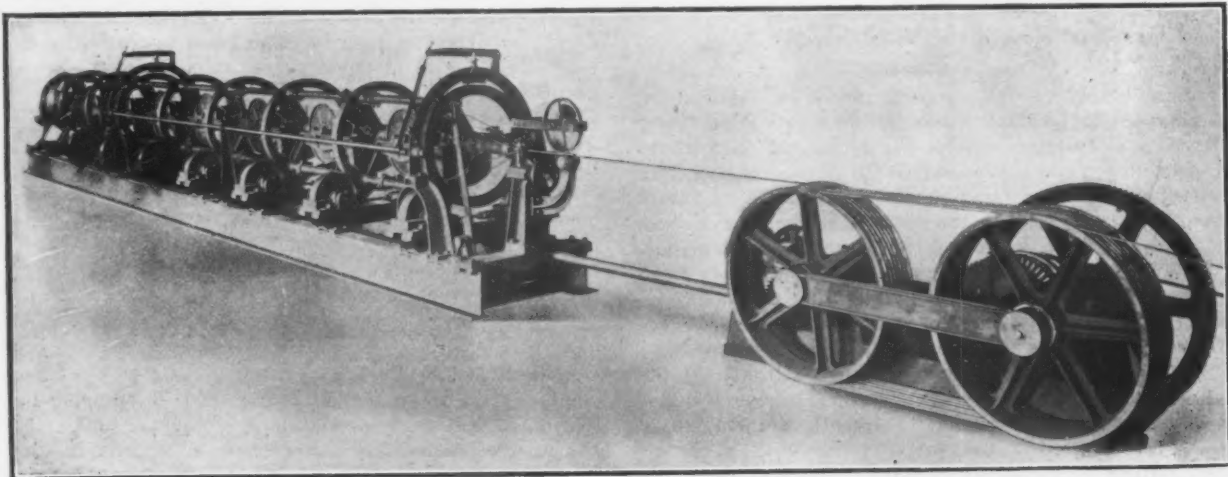


Fig. 1.—An English Type Wire Stranding Machine and Take-Up Built by the New England Butt Company, Providence, R. I.

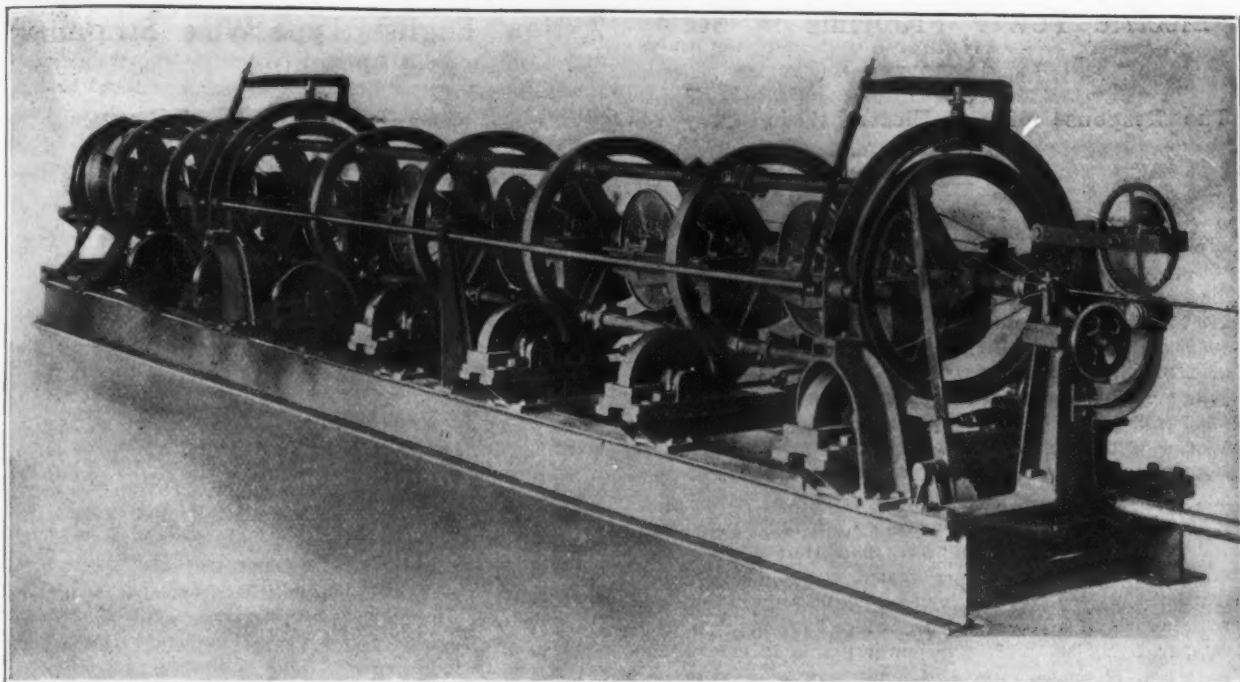


Fig. 2.—A Nearer View of the Wire Stranding Machine.

all converge to the lay-plate, or twisting head, which guides them to the die holder. This holder is adjusted longitudinally and holds split dies of different sizes.

The machine has 24-in. tight and loose pulleys for 6-in. belt on the rear frame wheel, and is positively connected by silent chain to a longitudinal shaft extending under the machine which drives the take-up. The take-up, shown in Fig. 1, is of the grooved double drum type and is supplied with a set of change gears for different lays. The receiving reel is arranged with automatic traverse motion adjustable for different sizes of wire. The stranding machine is equipped with a powerful brake for the quick overcoming of momentum, and all its moving parts are accurately balanced, i. e., the separating tubes with the bolts and nuts are all of the same weight and the frame wheels are accurately balanced.

The machine is equipped with a measuring device which measures the product. It consists of a light steel tired wheel exactly 3 ft. in circumference and 1 in. wide, keyed to a short stud and running on ball bearings. The wheel is mounted on a frame so arranged that it can be swung out of the way when the machine is being strung up preparatory to starting. The device is attached to the lower half of the die holder by an overhung bracket casting. The motion of the wheel is transmitted to a double brass dial by worm and spur gears. The upper dial is graduated to read in feet and the lower in multiples of 100 ft. Each is arranged with an indicating pointer, which can be quickly set back to zero. The space required for the machine without the take-up is 33 in. by 28 ft. 10 in. Machines of the same class are made by the company in sizes manufacturing products ranging from large wire rope to fine initial strands.

The annual report of the Stahlwerke Verband, or German Steel Syndicate, covering the year ending March 31, takes a different view of the reinforced concrete development from that presented in this country. The home trade in structural shapes is described as having been insufficient because the dearth of money restricted building operations, and because the great difference between the prices of bars and beams operated in favor of reinforced concrete construction, and to the disadvantage of the employment of beams. It is declared that reinforced concrete construction is now a serious rival. This has not yet become the case in the United States, although reinforced concrete construction has attained such large proportions that, as recently pointed out in these columns, from one-fourth to one-third of the recent output of large bar manufacturers has gone into concrete work.

New Products of the Colonial Steel Company.

The Colonial Steel Company, Pittsburgh, which two years ago commenced extensive experiments in the welding of composite metals, such as steel with either copper or brass, in its plant at Colona, Pa., on the Pittsburgh & Lake Erie Railroad, announces that since January of this year it has been supplying the trade with copper covered steel wire, combination steel and copper or brass sheets, copper covered steel in rods, &c., and that it is now prepared to manufacture this new product on a large scale in addition to its established line of tool steels. In order to take care of this new departure, the stockholders of the company met in Pittsburgh in September, 1908, and voted to increase its capital from \$1,250,000 to \$2,000,000.

The company has been furnishing composite steel and copper in rods $\frac{3}{8}$ in. in diameter to wire manufacturers, who, in turn, draw it down to the proper gauge. Arrangements have been perfected by the Standard Underground Cable Company to market the wire. The makers of composite steel and copper wire claim that it can be produced and sold for less than all copper wire; that as the grade of steel used is high in quality, it strengthens the wire and permits of longer life, and that the welding of copper over the steel can be controlled to such an extent that it can be made to any gauge to suit the electric current. Composite steel and copper is also being rolled in sizes running from No. 24 sheets to plates $\frac{1}{4}$ -in. thick. This product is extensively used by sheet metal workers for spouting, &c., or for other uses for which a copper surface is desired. The brass and steel sheets are suitable for stamped ware, telephones, electrical fixtures, &c.

The company has not planned any extensions to its works at this time, its present buildings and equipment being suited to its requirements. It is operating nine crucible steel furnaces, two open hearth furnaces, one blooming mill, a 9, a 12, and a 16 in. bar mill, three sheet mills, a plate mill and hammers ranging from 600 lb. to 7 tons. It can produce about 100 tons of composite metal in rods, sheets, &c., per day.

The Bessemer Gas Engine Company, Grove City, Pa., builder of the Bessemer gas engine, and its affiliated interest, the Keystone Gas Producer Company, builder of gas producers, are now represented in Canada by the R. A. Williams Machinery Company, Ltd., Front street, Toronto.

Electric Power Problems in Steel Works.*

The Response of the Electrical Industry to Recent Demands.

BY R. TSCHENTSCHER.

Previous to September, 1904, the capacity of electric power plants in American steel mills varied locally from 200 to 3000 kw. The largest units were of approximately 1000 kw. capacity, and only direct current at a pressure of 250 volts was used. Plans in contemplation over a year before 1904 resulted in the construction of the first steel mill power plant of any magnitude at the South Works of the Illinois Steel Company. This plant consisted of a 4000-kw. station, composed of two 2000-kw. 25-cycle, three-phase, 2200-volt steam engine driven generators. It was put in operation during September, 1904, and supplied two converter substations, transformers for local alternating current motors and a 22,000-volt transmission line 10 miles long supplying alternating current motors at a cement plant. Since 1904 many of the comparatively small electric power plants in steel mills have been increased to several times their original capacity. Steel mills may be divided into four general classes—namely:

A. Finishing mills, or those that buy steel in the shape of blooms or billets and reduce them to a commercial form.

B. Steel making mills, or those that buy iron and other materials needed in making steel. These mills are equipped with steel furnaces, and reduce their product to a commercial form.

C. Self-contained steel mills, or those that buy the raw materials necessary to make iron. These mills are equipped with blast furnaces, steel furnaces and rolling mills for finishing the product.

D. Self-contained steel mills which also supply power to auxiliary plants, such as cement mills, or to other consumers.

Finishing Mills and Detached Steel Plants.

A. The electrical problems differ somewhat in the mills as classified above. In finishing mills the electric plant usually consists of a direct current, steam driven station of from 200 to 1000 kw., supplying power for table motors, cranes, conveyors, lights, &c. No alternating current power is used, and the maintenance is a simple matter. The future problems of such a plant may result in the installation of motors to drive the mill rolls, replacing wasteful noncondensing engine and inefficient boiler equipment, and the installation of a modern efficient generating system, either steam turbine or producer gas engine driven (unless natural gas is available). The matter of installing storage batteries and other refinements is a local one.

B. In existing steel making mills the electric plant, though similar to that of plant A, is of somewhat larger capacity, ranging from 400 to 2000 kw. The power demand is also for a similar purpose, and a mixed alternating current and direct current system is not required. The future problems of such a plant are similar to those of plant A. The development of the electric steel furnace may, however, be such that a commercially feasible equipment might result and "cold metal" (pig iron, scrap, &c.) be converted into steel, thus doing away with cupolas or Bessemer converter installation. The electric power problem would then be materially altered, as described later.

Mills with Connected Blast Furnaces.

C. In existing self-contained mills the present problems are so diversified that a generalization is not as feasible as in the two preceding classes. The electric plant problem is virtually a local one. A few general remarks may, however, be made. The electric power

plants of such mills range from 500 to 10,000 kw. capacity, the larger capacity depending upon whether motor driven rolling mills are in service and other considerations of large power demand. In plants without motor driven rolling mills a single direct current system often exists, which, when properly arranged, makes for a decidedly simple and easily maintained equipment. The power demand consists of: 1. Ore handling equipment, such as unloaders, conveyors, distributors, &c. 2. Sundry blast furnace service, such as raw material supply cars, skip hoists, &c. 3. Steel furnace application, such as raw material, hot metal and scavenger cranes, charging machines, stripper cranes, &c. 4. And for the sundry rolling mill purposes as previously enumerated.

In mills without large concentrated power demand the problem of installing storage batteries is a local one, and will depend frequently on the ore handling equipment. If this be considerable, or if located some distance from the power plant, then questions of power plant capacity or of voltage at the ore handling plant may be solved advantageously by proper storage battery installation instead of added direct current generators in the former case and alternating current generators and converters in the latter case. Where such ore handling load does not exist, the station power fluctuations will in general not be over 10 or 20 per cent., and sufficient generating equipment only is needed. This equipment may be operated at a high load factor, the necessary maintenance being attended to on Sunday when the rolling mill load does not exist. The desirable arrangement of simplicity and uniformity of equipment which exists in every industry is most pronounced in mill work on account of the comparatively large repair expense, the inefficient operatives and the costliness of delays. Therefore, a single generating system with simple distribution is desirable and feasible in plants of this kind.

In plants with motor driven mills or other sources of considerable power demand, the problem becomes rather complicated. Again it is one of local treatment, though no doubt a few general principles may apply. The generating requirements will in most cases result in an alternating current equipment. If the plant is an existing one and inefficient rolling mill engine and boiler equipment is to be replaced by motors operated by means of efficient power generated in the vicinity of the blast furnaces so that blast furnace gas may be utilized, then the commercial limitations will not usually admit of replacing the existing direct current generating station. A second station must be built, either adjoining the direct current station or at some more advantageous point. Proper electrical connecting apparatus between the two stations must be supplied. This will usually consist of a converter floating between the two station bus-bars. The advantage of this arrangement cannot be overestimated, as operating conditions will usually be such that at stated intervals (Sundays) either station may be shut down in whole or in part. The selection of proper alternating voltage may also be a local one, though the experience of the last five years shows that the increase of electrical application in steel mills is so rapid that a pressure of less than 6600 volts for local generation and distribution will no doubt result later in an unwieldy arrangement of switchboard and cable equipment and distributing feeders. The frequency of 25 cycles, now used almost exclusively, is most suitable, and nothing has yet appeared to indicate that a higher or a lower frequency would be more desirable.

Self Contained Steel Mills Which Supply Power to Auxiliary Plants.

D. It will no doubt be of some interest to discuss specifically a few of the electrical problems encountered in a large steel mill. For this purpose the plant of the Illinois Steel Company at South Chicago, Ill., will be outlined. This plant comes under classification D, previously referred to—namely, self-contained steel mills which also supply power to auxiliary plants such as cement mills, or to other consumers. Naturally enough, it is in such plants that the greater variety of electrical problems exists and where electrical application will be most extensive.

* A paper read at the 26th annual convention of the American Institute of Electrical Engineers, Frontenac, N. Y., June 30, 1909.

The South Chicago Works of the Illinois Steel Company is a good example of the self-contained steel mill. Its development during the last five years has been remarkable. Prior to September, 1904, the electrical equipment of this plant consisted of a direct current generating equipment of 2900 kw. at 250 volts pressure. Even at that time this was the largest electrical installation in an American steel plant. The electrical power demand consisted of that usually found in mills under classification C—namely, all classes of cranes, mill tables and miscellaneous equipment, illumination, &c. Since that time additional blast furnaces, ore handling equipment, steel making mills, finishing mills and two cement plants have been added. Where steam engines had been used at blast furnace skips, motors were installed and the cost of operating was reduced. Where steam engines had been used for ore handling and for all new ore handling equipment, motors were installed, the output increased and the cost reduced. Where new rolling mills were designed, motors on the main rolls were specified, with consequent increased tonnage at lower fuel and maintenance costs. Where new cement mills were installed, motor drive was employed throughout and power obtained by means of high voltage transmission lines from an efficient power plant. Again the output was increased and the cost reduced.

Without going further into details, the electrical installations at this plant have resulted during the last five years in an equipment approximately as follows:

No. of motors, both alternating current and direct current	2,000
Total motor horsepower	75,000
Total number of arc lamps	1,500
Total alternating current generating equipment installed, kilowatts	16,000
New alternating current generating equipment being installed, kilowatts	9,000
Total direct current generating equipment installed, kilowatts	3,000
Total generating equipment, kilowatts	28,000
Total synchronous converter (and transformers) and motor-generator equipment, kilowatts	6,500
Total storage battery equipment, kilowatts	1,200
Total transformer equipment, kilowatts	31,000

The variety of the equipment may be judged from the various existing voltages—namely, 250-volt direct current; 110, 440, 1100, 2200 and 22,000 volt alternating current. This plant comes under the heading of "evolution plants"—that is, plants where in steam and hydraulic equipment have been in process of replacement by electrical equipment. The solution of the various problems in such a plant does not result in the more desirable and simple systems which will be found in future new plants, for in the new plants the large variety of voltages mentioned above will surely be avoided.

Utilizing Waste Heat.

One of the problems in steel mills now receiving considerable attention, and which in the future will be one of the real engineering problems, is the conservation of waste heat. The existing waste heat at open hearth furnaces forms an enticing point of attack. This waste may be eliminated by replacing such furnaces by electric steel furnaces. These furnaces will be mentioned later. However, the waste heat at rolling mills does not as yet appear to be capable of satisfactory elimination. All steel before being rolled must be heated, so that an even temperature and hence even consistency throughout the piece will result. Producer gas furnaces are now used almost exclusively for this purpose. The stack temperatures are usually very high, being between 800 and 1200 degrees F. These temperatures may readily be reduced by passing the gases through suitable steam boilers to provide steam for turbine generators. It is not at all improbable that instances exist where with proper installation of boilers, regenerators, turbine generators and roll motors, a rolling mill may be made a self-contained unit, obtaining from its present waste heat sufficient power to supply electrically the entire requirements of the mill, including the roll motor, table motors, crane equipment, lights, &c.

The utilization of the energy remaining in the exhaust from noncondensing engines and from compound engines is now receiving serious consideration, the large amount

of energy being wasted in engine exhaust steam in non-condensing engines being roughly estimated at 50 per cent. of the total available energy. The rolling mill engine appears to offer a very desirable point of attack in this connection. However, the writer wishes to emphasize that there are many other places in most steel plants where this problem might better be attacked from the standpoint of permanent equipment. By attaching a low pressure turbine equipment to the exhaust of a noncondensing rolling mill engine, a premium is put on the retention of that engine in service. The superior operating and cost advantages of motor drive over reciprocating engine drive (with accompanying boiler equipment) cannot be taken advantage of. The steam engine with a tail in the form of a turbine generator will be much more difficult to get rid of. It would, therefore, appear that the other weak points about the mill should be first seriously investigated.

Low Pressure Turbines.

The steam engine blowing equipment at many blast furnace plants consists of well built compound engines. The possibilities here for low pressure turbine installation are very great. At a plant which recently came to the writer's attention, four blast furnaces receive blast from eight modern condensing blowing engines. Roughly, the amount of steam required by these engines is 300,000 lb. per hour. By the addition of less than 100,000 lb. these engines develop their required power with exhaust at 16 lb. absolute. These 400,000 lb. of steam would be sufficient to supply a low pressure turbine generator capacity of approximately 15,000 kw. The power station installation might consist of three 5000-kw. units. Sufficient power would be available to convert all the mills at this plant to electric drive.

One of the electrical problems at the plant of the Illinois Steel Company, which may be of interest, concerns the installation of additional generator capacity. A solution of the problem which contains many admirable points was an installation of a low pressure turbine so designed that high pressure steam up to full capacity will be economically utilized. Compound condensing reciprocating engines in the power station and in an adjoining blowing engine station will normally supply the steam for this turbine which will be of 9000 kw. capacity. Each compound engine will be so arranged that it may exhaust into the present condenser, or into the turbine main at slightly above atmospheric pressure. In case of insufficient low pressure steam, the deficiency may be supplied from the high pressure main, the turbine being so arranged that this high pressure steam will be economically employed by means of a separate valve and nozzle chamber. Should no low pressure steam be available, the full capacity at high pressure steam may be obtained. The condensing equipment will be adequate, the yearly calculated vacuum averaging better than 1 in. absolute pressure. Reliability and economy are the predominating features in the installation. The operation will be watched with interest, and it is expected that gratifying results will be derived.

Improving Power Factor Conditions.

Another problem at this plant which may be of interest was the improvement of the power factor. The installation of alternating current roll motors, miscellaneous small alternating current motors, and the expansion of cement mills where the sole drive is by induction motors, has so affected the power factor that at present the station power factor is not over 70 per cent. The largest item in bringing about this condition is a load of approximately 7000 kw. of induction motors at a cement plant supplied by a 10-mile transmission line of 22,000 volts stepped down to 440 volts. Improvement of the station power factor by corrective means at the cement plant at once suggested itself. This might originally have been accomplished either by the installation of direct current equipment including motor generators or synchronous converters or by the use of a considerable number of synchronous motors in place of induction motors. The operating conditions—character of service, cement dust and inefficient operatives—make the former comparatively impracticable; the additional complication of

miscellaneous operation of synchronous motors at proper power factor by inefficient help makes the latter also undesirable. It is an ever present requirement in steel mill practice that the mill equipment should be simple, rugged and easy of operation and repair. Whatever refinement and complication may be beneficial should be confined to engine rooms, power stations, substations, &c., where labor more skilled in maintaining the equipment may be employed. The foregoing, therefore, decided that the cement mill equipment should include the induction motor, the squirrel cage type being used wherever possible, with simple starting apparatus, such as step-down transformers with starting bus-bars, instead of local compensators and starters for each motor.

The question of power factor correction resolved itself then into the installation of "synchronous condenser" equipment. In order to prove such an equipment commercially advisable, it is of course desirable to have the so-called condenser do mechanical work, so that such proportion of its initial cost and operation and investment expense could be charged against it, making the charge for power factor correction correspondingly less. However, mechanical work of sufficient magnitude did not exist at the cement plant, and the problem resolved itself into determining whether such a synchronous condenser equipment operating idle would prove a commercial proposition. A detailed study of this case was made; the following items give the points at which loss of energy would be reduced, a loss that could be expressed commercially, most of the factors being the components which influence combined efficiency.

- a. At station generator fields, due to less excitation being required as the power factor improved.
- b. In station cables and switchboard equipment, on account of less current at improved power factor.
- c. In step-up transformers, due to improved power factor.
- d. In transmission line, due to less current and improved power factor.
- e. In step-down transformers for the same reason.
- f. In step-down transformer wiring and switchboard equipment.

To offset the foregoing there is the energy required to operate the so-called synchronous condenser. With a delivered load of approximately 7000 kw. at 70 per cent. power factor, the over all efficiency is approximately 83 per cent. The installation of two 1650 kilovolt-ampere synchronous condensers will raise this over all efficiency to 87.5 per cent., the net gain of power being approximately 300 kw., which at 0.5 per cent. per kilowatt hour represents a yearly saving of approximately \$10,000. In addition to this, the power station capacity will be appreciably increased, due to the present engine capacity exceeding present generator capacity, and due in a small measure to decrease of excitation load. This gives the commercial aspect. The purely technical aspect of improved operation (regulation and control) due to improved power factor needs but to be mentioned.

Where alternating current motors are used to drive rolls, or for miscellaneous mill purposes, such as for tables, cranes, &c., where now direct current motors are used almost exclusively, the power factor conditions will no doubt require power factor correction; this may be accomplished by the installation of adequate synchronous condenser installation. The commercial problem will here be rendered more simple, for considerable mechanical load in the nature of air compressors, pumps, fans, &c., may be supplied to render the charge for power factor correction materially less than that outlined above.

Current for Electric Steel Furnace.

Before closing, it may be of interest to dwell upon another problem of considerable magnitude which is just becoming manifest. This refers to the manufacture of steel by means of electric power. The Illinois Steel Company has in operation a 15-ton electric furnace of the carbon arc type. Three 750 kilovolt-ampere, 2200 to 100 volt, 25-cycle transformers are installed. That the making of steel by means of electricity will in the near future be an active commercial proposition in the manufacture of product where now crucible, open hearth and Bes-

semer steel is used, is practically an established fact. The extent to which electric power will be necessary for this purpose can easily be conceived to require power stations of a magnitude comparable with those of the largest lighting and railway plants. The writer believes the future will demonstrate that the country's largest power generating stations will be found within the confines of the steel plants. When one considers that a steel making furnace plant utilizing electric power to generate the necessary heat and having a capacity of 4000 tons per 24 hr. requires generating capacity of 20,000 to 30,000 kw., it is not difficult to conceive the magnitude toward which the future steel mill power plant will tend.

Let this thought be carried a little further to illustrate a plant wherein the application of electricity would be supreme. A 2,000,000-ton per year self-contained plant where coal, flux, ore and other raw materials enter and were all classes of steel products, together with cement and the by-products of coke ovens, leave the plant as finished salable product, might consist of a blast furnace plant, a Bessemer converter plant, an electric steel refining plant, a sufficient number of rolling mills, a cement plant and a coke oven plant. Such a plant would require electric generating capacity depending largely on the extent to which the finished product is carried. Consider the plant as finishing three-fifths its product as rails, one-fifth as plates and one-fifth as structural shapes. The total electric power requirements for such a plant would be over 100,000 kw., and it is quite likely that such power could be generated without burning coal for power generation fuel purposes. The so-called waste gases of blast furnaces and coke plants and the utilization of other waste heat will supply more than the required fuel.

If now a plant be conceived wherein the product is further finished; for example, into the tin plate, wire, &c., a point may be reached where fuel must be obtained from sources other than the usually considered waste sources about the plant. The possible reduction of iron from ore by electrical application, or the manufacture of steel electrically direct from ore, are mentioned merely to show a possibility. The realization of such a possibility would produce a problem, the solution of which would result in power plants in comparison with which the foregoing mentioned equipment would be inconsiderable.

Pittsburgh Engineers Discuss Contracts.—The monthly meeting of the structural section of the Engineers' Society of Western Pennsylvania was held in the Fulton Building, Pittsburgh, on the evening of September 7. The subject for discussion was "Contracts, with Special Relation to Structural Steel Work." J. A. McEwen, engineer with the Pittsburgh Bridge & Iron Works, opened the discussion. Watson B. Adair, attorney, spoke on "Penalties and Business Damages for Failure to Complete"; H. M. Stilley, attorney, on "Liability for Damages During Construction"; S. A. Schreiner, attorney, on "Arbitration of Disputes"; O. M. Topp, architect, on "Relations of the Architect to Other Parties in a Contract"; V. R. Covell, deputy county engineer, on "Relations of the Engineer to Other Parties in a Contract," and Edward Godfrey, engineer with Robert W. Hunt & Co., on "Relations of the Inspector to Other Parties in a Contract."

The Franklin Steel Company, Franklin, Pa., has for several years operated the bar mill of the Rogers Shear Company, which contains an 18 and 12 in. Belgian train, confining its output exclusively to rounds, squares, flats and square twisted bars for concrete reinforcement. The Rogers Shear Company was the sole selling agent of the product of this company during that time. The Franklin Steel Company has now bought the interest of the Rogers Shear Company in the mill and will hereafter sell the entire product. The company is now in position to give even better attention to customers. It is prepared to make prompt deliveries, having on hand a large stock of bars of all kinds and sizes from which it can ship at short notice in any quantity.

Burt Oil Filters at Gary.

A second order for five unit type oil filters has been received by the Burt Mfg. Company, Akron, Ohio, for installation in the Indiana Steel Company's plant at Gary, Ind. The equipment will be a duplicate of the one already in operation and shown in Fig. 1, and will be

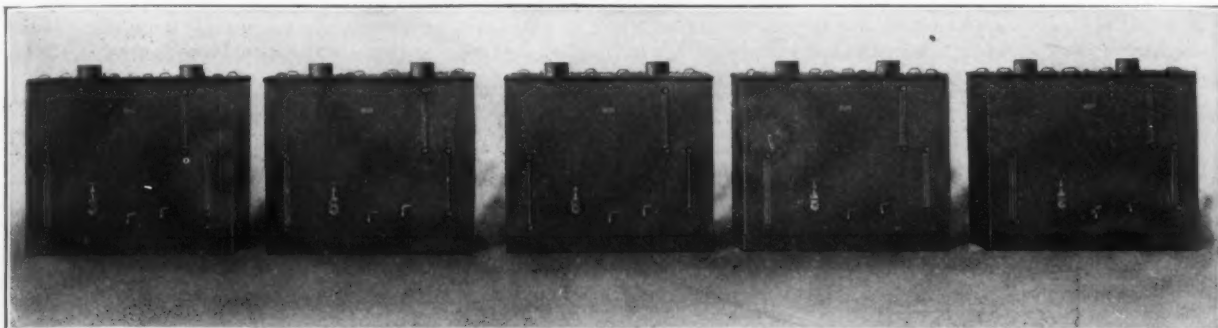
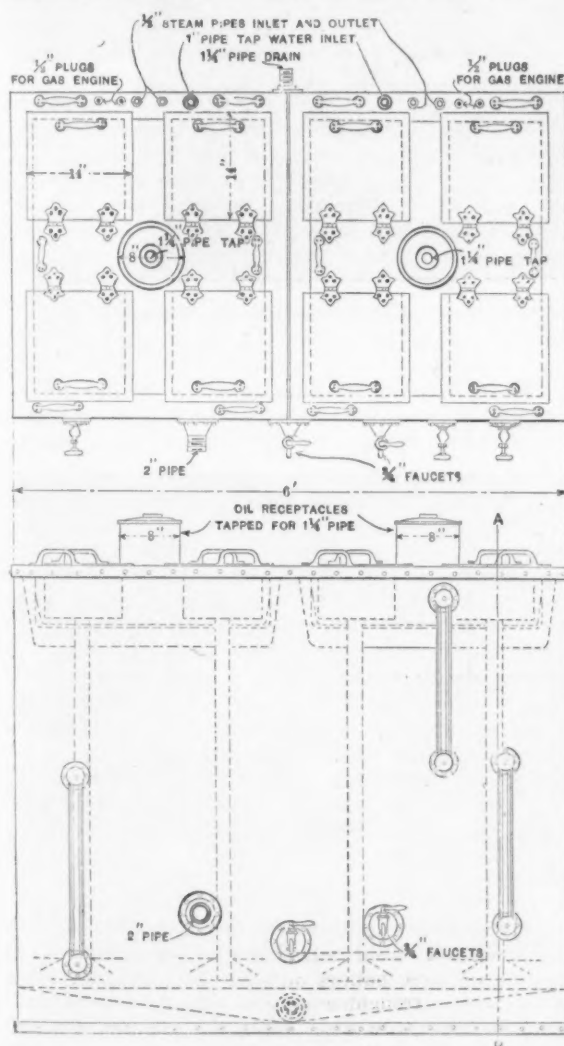


Fig. 1.—The First Installation of Five Burt Unit Type Oil Filters for the Indiana Steel Company, Gary, Ind.

placed in the company's billet mills. The 10 unit filters constitute one of the largest installations in the world, representing a combined capacity of 20,000 gal. per hour.

Fig. 2 is a sectional view of one of the special type unit filters installed in the plant, which differs, however,



the bottom of which there is a sediment pan. Beneath the pan is a hot water chamber heated by steam, which serves to heat the oil, making it flow more freely and more readily deposit the bulk of its impurities in the sediment pan. The oil then enters cylinders surrounded by filtering cloth, and passing through the cloth and draining from the cylinders, down through pipes to the bottom of the filter. The lower ends of these pipes are

terminated with disks, under which the oil spreads out in a thin layer, and is thoroughly washed by the water in which it is submerged. Leaving the outer edges of the disk the oil rises to the surface of the water, thoroughly pure and ready for use again. As the water in the bottom of the filter becomes foul it can be drawn off to the sewer carrying with it all the impurities which remain in that part. The bulk of the impurities, however, are detained in the sediment pan at the top from which they can be easily removed.

At Gary there is being used what is called the flush system of lubrication, where an immense quantity of oil is being used on the bearings and a large filtering capacity is required. The five units are guaranteed to have a filtering capacity of 10,000 gal. of oil per hour. These filters are made of No. 10 gauge iron for the outside shell, each unit 6 ft. long, 3½ ft. wide and 5 ft. high, and have eight filtering cylinders instead of two, such as are used in the company's regular filters of the unit type. Fig. 2 shows the large storage capacity for pure oil (490 gal.), and the hot water chamber at the top to heat the oil and facilitate the filtering. The dirty oil chamber

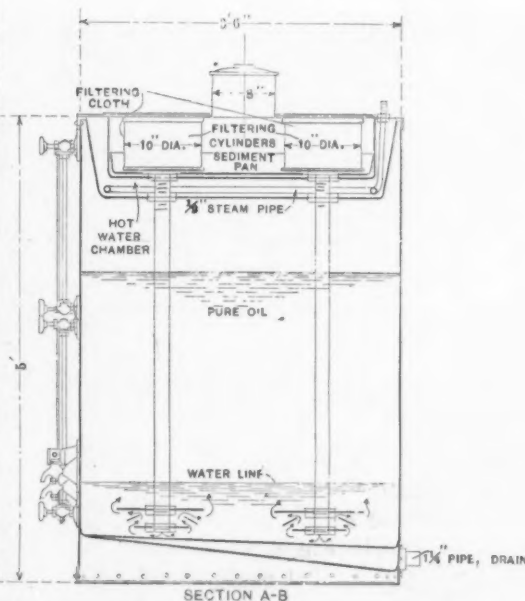


Fig. 2.—Top and Front Views and Side Sectional Elevation of One of the Special Burt Unit Filters Installed at Gary.

but slightly from the standard form, which has already been described in these columns. Briefly reviewed, the action of the filter is as follows: The oil is taken in at the top, through the waste oil receptacle, and flows horizontally through perforations in the bottom of this receptacle into a chamber at the upper part of the filter, at

has a capacity of 90 gal., and the water chamber 110 gal. The filters can be arranged for use with either steam, gas or gasoline engines. Ordinarily the filter cylinders contain some filtering medium, such as bone black, white waste, excelsior, raw wool, &c., but in this case the filtering cloth alone is sufficient.

Dodge Coal Grading and Handling Equipment.

At industrial plants where fine and lump coal is used it is no longer the best practice to order the two grades separately, *i. e.*, to have them screened at the mine, but to purchase run-of-mine instead and separate it into the desired sizes at the plant. For doing this work the American Iron & Steel Mfg. Company, Lebanon, Pa., has installed a screening and conveying system furnished by the Dodge Mfg. Company, Mishawaka, Ind., which takes

power house. The large coal is thus handled by belt conveyors; the small coal by screw conveyors and a bucket elevator.

Placed transversely beneath the screen is an 8-ft. length of 12-in. screw conveyor, which discharges the small coal into a 21-ft. section of the same size, placed in inclined position. This delivers into the boot of the elevator, shown in Fig. 4. From the elevator head a long 12-in. screw conveyor overhead distributes over the length of the structure.

The capacity of the equipment is 25 tons per hour, so the contents of five 100,000 lb. cars can be unloaded,

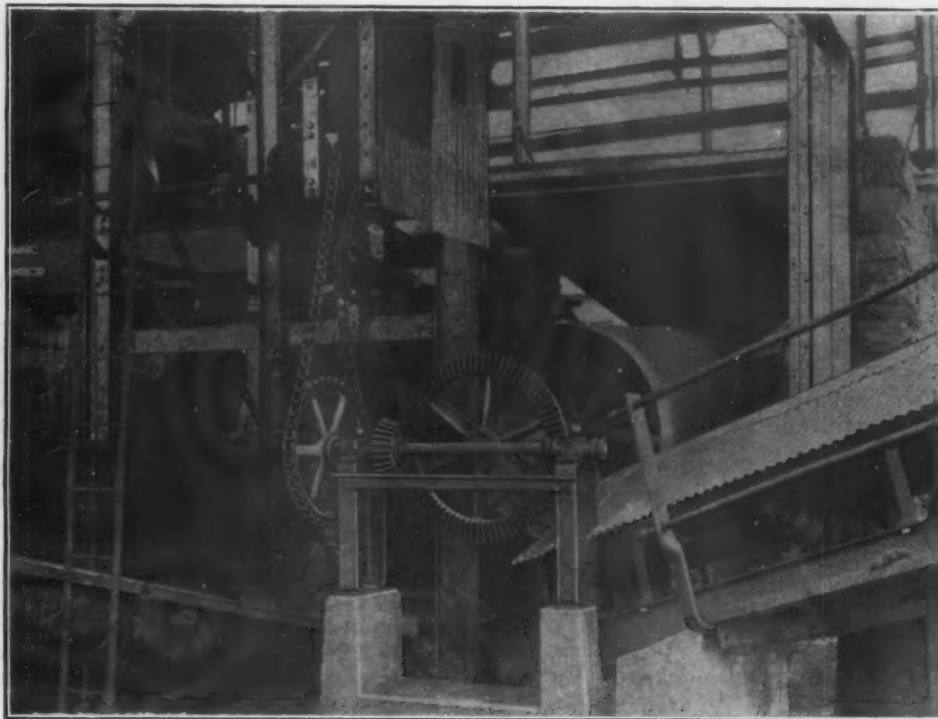


Fig. 1.—Coal Receiving and Screening Point in the American Iron & Steel Mfg. Company's Plant at Lebanon, Pa.

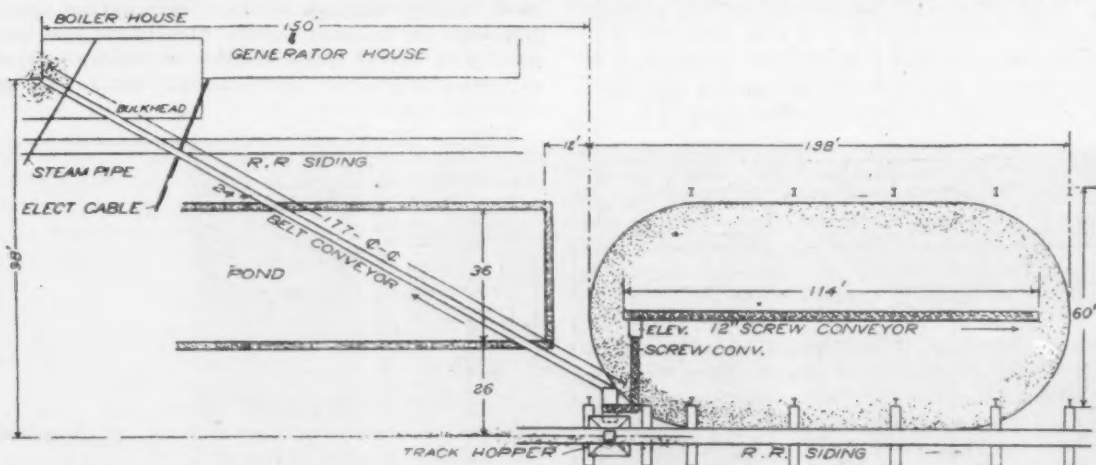


Fig. 2.—Plan Showing the Location of the Coal Storage and Conveyors.

the run-of-mine coal and separating the large from the small delivers the two independently to storage where planned.

Alongside the storehouse is a railroad siding, elevated to pass above a track hopper into which the coal may be dropped directly from the bottom dump cars. From the hopper the coal descends into a rotary screen, shown in Fig. 1, having perforations of such size as to effect separation into the grades desired. Fig. 2 shows a plan of the arrangement. The small coal that passes through the screen is handled by a system of screw conveyors and a bucket elevator, and distributed to storage in an oval pile on the floor of the building. The large coal tails out of the rotary screen and on a 24-in. belt conveyor, which carries it up and over a pond and a railroad siding, as shown in Fig. 3, a distance of 175 ft., to storage at the

graded and stored per day of 10 hr. The conveyor belt is 24 in. wide and is carried in Dodge standard rolls, in self-oiling bearings. Each roll set on the upper or load side consists of three pulleys on a horizontal shaft, between the inclined troughing pulleys at the edges. The lower or return belt runs on straight rolls, spaced at double the interval of the upper rolls. The belt speed is 150 ft. per minute. The length on centers of the head and tail pulleys is about 177 ft.

The elevator is of the continuous bucket type, with 12 x 7 x 12 in. buckets. Its speed is 120 ft. per minute. The screw conveyors are 12 in., with steel casings. Their speed is from 100 rev. per min. at the screen to 114 rev. per min. for the long overhead distributing conveyor. The screen, screen conveyors and elevator are all driven from an electric motor in an elevated housing within the

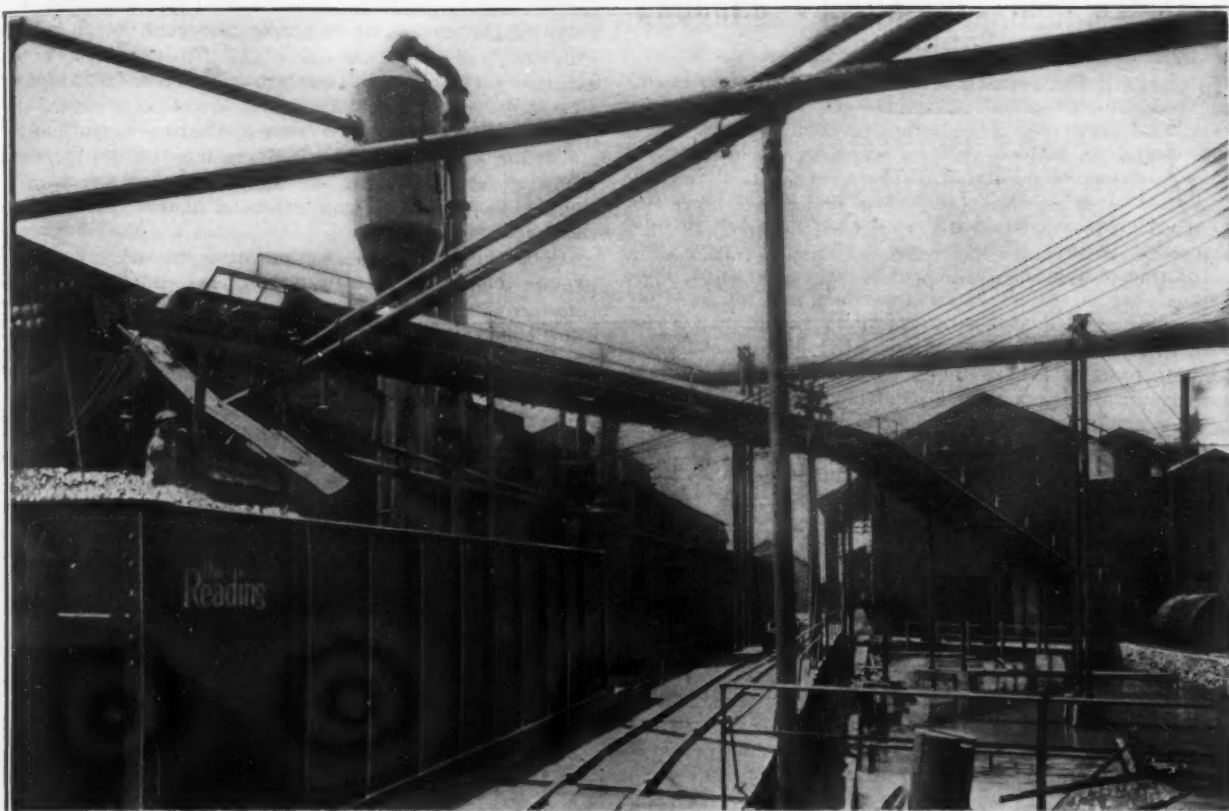


Fig. 3.—The Belt Conveyor Which Carries the Lump Coal to Storage at the Boiler House.

building. The belt conveyor, which must be driven at its head or discharge end, is operated by a countershaft from the boiler room.

The outfit, according to officers of the company, is proving itself well adapted to the conditions and is operating successfully.

C. E. Watson, formerly of the steam and hydraulic division of the National Department of the National Tube Company, McKeesport, Pa., is now connected with the Republic Mfg. Company, North Side, Pittsburgh, as manager, while H. D. Lyons is its secretary and office manager. The company conducts a general machine busi-

ness, including the operation of a brass foundry, and makes a specialty of contracting engineers' work, &c., on which it is operating its plant to full capacity.

The Cunarder Lusitania, which docked in New York City on the evening of September 2, clipped hours from the best previous record for westbound Transatlantic steamships.

It covered the course between Daunt's Rock, outside Queenstown, and the Ambrose Channel Lightship, off Sandy Hook, in 4 days 11 hours and 42 minutes, cutting from the record of the Mauretania, made on August 19, 2 hours and 56 minutes. The average speed was 25.85 knots.

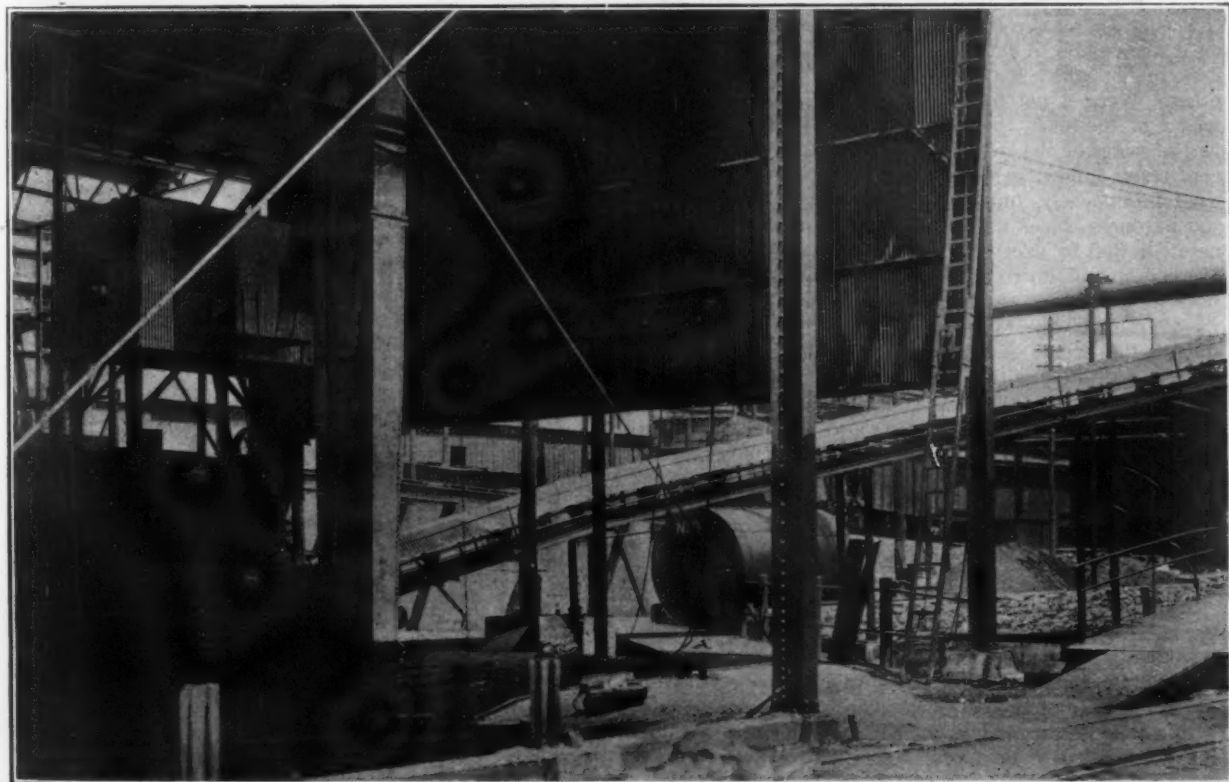


Fig. 4.—General Arrangement of the Dodge Coal Handling Equipment at the Coal Storage House.

The Production of Sound Castings.*

Important Factors in Melting and Pouring Iron.

BY ROBERT BUCHANAN.

In the cupola, the bed of coke should not be too much burned; that is, should not be too early kindled before charging begins. Then follows a charge of iron; then a charge of coke on top, followed by a charge of limestone, say 40 to 50 lb. of limestone per ton of iron charged. The quantity of limestone should rather be stated in connection with the quantity of coke charged; but in practice I have found that charges of limestone sufficient to give a slag brownish-yellow in color, and just stopping short of being viscous and deficient in fluidity, give the best result as regards absorption of sulphur. The completest absorption of the sulphur possible is of great importance. A hot cupola and hot melting also work toward that desirable end by making the slag fluid and actively basic. The first iron melted is highest in sulphur because the slag is not yet in a completely fused condition at the temperature then obtaining. That is another way of saying that slag has a higher melting point than iron.

Care has to be exercised that too much air is not blown into the cupola. Many foundrymen and cupolamen have the idea that the more air is blown into the cupola the faster the melting is done and the greater is the economy of coke. It is too often forgotten that much of the excess of oxygen blown in will combine with valuable constituents of the iron, such as the silicon, manganese and carbon, and with the iron itself, leaving practically untouched the constituents we oftentimes would be glad to see lessened, viz., the phosphorus and sulphur. With over-blowing there is also the waste of heat carried off by the nitrogen, which forms four-fifths by volume of the whole quantity of air blown into the cupola. Thus, if one uses 30,000 cu. ft. of air in melting 1 ton of iron, 24,000 cu. ft. of nitrogen passes through the cupola, taking heat with it and doing no useful work. Careful observers like F. J. Cook, president of the British Foundrymen's Association, have noted the combined effect of volume and pressure of blast upon the character of the iron melted. With easy blowing the desired quality of softness is obtained, if the mixture is properly made up in the charge; but should the same mixture be desired harder and closer grained, increased blowing will make it harder and closer. This knowledge is useful in so far as it allows one to obtain similar hardness in two cylinders, one of which may be considerably heavier than the other. Were it not for this control of the hardness by means of the blast, the heavier casting would, of course, be the softer of the two. This is an instance of a beneficial result following increased blast, an increase of blast used intelligently, but in the greater number of cases the hardness comes unsought and undesired. One other result is that by excessive blowing of the blast "drawn" castings are produced in greater excess than they otherwise would be, and the hardness and the "drawing" are most probably due to the lessening of the total carbon, due to the excess of air blown into the cupola. I am glad to note that within the past year or two there has been a reaction in the minds and practice of some able foundrymen regarding blast pressure and volume. Increased tuyere area, with reduction of blast pressure, will almost certainly come more and more into use. What is desired is to get into the cupola, with the least trouble possible, the necessary volume of air. The only pressure necessary is that which will cause the proper volume of air to pass into the cupola.

Changes Which Take Place in Melting.

Whether we mix our iron by taking fracture for our guide, or by the better and more exact method of mixing according to the analyses of the irons composing the mixture, we find that various changes have taken place during the melting of the iron. Using a coke with 0.75 per

cent. of sulphur the iron when melted will be found to have gained an addition of 0.038 per cent. of sulphur. This was the average result of 12 meltings of iron of exactly similar composition, the same quality of coke and same volume of blast. It is to be noted that the manganese in the iron did not exceed 0.5 per cent. We now know that manganese has a marked effect in neutralizing sulphur. Such an apparently small gain of sulphur as 0.038 may appear negligible, but that is not the case by any means, as sulphur has a more powerful effect, according to the amount, than any other constituent present. If one were to say that this effect is 10 times greater, according to percentage, than that of any other constituent, it would not be an exaggeration. Sulphur in the casting should not exceed 0.10 per cent. If a free working iron is required.

It has also been found that in the course of one melting manganese loses 0.1 per cent., but that is not of much importance to users of Scotch or North Staffordshire irons, seeing they are mostly high in manganese. Silicon is lost to the extent of from 0.25 to 0.30 per cent., and this has to be provided for, however the mixtures are made, if the resulting iron is to be of the quality desired.

We now come to the carbon, the most important constituent of cast iron if we leave out of view the iron itself. The quantity, and especially the condition in which the carbon shall exist in the casting, very largely determine whether the casting shall be hard or soft, strong or weak. The iron founder who knows how to dominate the carbon so that it may be in the exact proportions and condition desired in the casting has the secret of producing the most suitable iron for a specific purpose. If one has not skill or knowledge enough to dominate the carbon, and so be unable to determine the proportion which shall be present in the casting as combined carbon, and the remainder necessarily as graphite, then such an one has a very poor chance of making castings consistently of one quality.

If there is a low total carbon in the iron charged into the cupola, and the bed and charges of coke are ample, and a normal quantity of air is blown, then under these conditions the iron will absorb carbon from the coke and run from the cupola with more carbon than when it was charged. With the charges of coke cut down to a fine point, and with a large volume of blast, you get the conditions under which there is a lessening of the carbon. But not only is there a lessening of the carbon; there is oxidization of the iron as well.

We will now suppose that the iron has been melted hot, as all iron should be for the best results, and is in the ladle, what are the potentialities and condition of the various components present in the molten iron?

There is sulphur, phosphorus, manganese and carbon, dissolved in the iron, just as one would dissolve sugar in a cup of tea. The difference of temperature of the two fluids does not affect the analogy. The sulphur, however, is combined with iron as sulphide of iron, and where enough manganese is present some of the sulphur is combined with manganese as manganese sulphide, the latter being a beneficial result. The phosphorus is present as phosphide of iron, Fe_3P , and this phosphide gives fluidity to the iron. The silicon and carbon are also dissolved in the iron, as already mentioned.

Effects on the Casting.

We may now consider the various potentialities of these various constituents when run into the casting. We have found by experience that the metal should be melted hot. For one reason the sulphur is lower in iron melted hot, and another is, that hot metal can be allowed to stand for a little, and this permits the entangled slag to rise to the surface of the iron and so be skimmed off. This waiting also allows the manganese to combine with sulphur and also rise to the top and there be skimmed off, or, if not skimmed off, be prevented by ordinary skimming from entering the casting.

It is of importance that the metal be cast fairly hot, seeing that the carbon readily comes out of solution as graphite even when the iron is in a liquid condition. In fact, the mechanical flow of the iron assists the extrusion of the carbon. This extruded carbon causes sponginess wherever it is segregated.

* From a paper before the West of Scotland Iron and Steel Institute.

Mr. Munnoch has recently confirmed some observations by J. E. Stead, which show that where blowholes are present in castings fairly high in phosphorus, the growth of the flakes or plates of graphite often pushes the fluid phosphide of iron into the blowholes. The blowholes would be hollow were they not filled by the phosphide, but when filled by the phosphide this appears as hard, white spots. If one examines a blowhole which is still hollow there is often to be seen a small globular body which has been pushed into the hollow space, and this, I think we may assume, is the phosphide, but it has either been deficient in quantity, or, what is more probable, wanting in fluidity to fill the space.

It is generally agreed, I believe, that what is known as "pinholing" arises from excess of sulphur in the iron, this excess not being neutralized by sufficient manganese being present, as already referred to. The sulphide of iron holds gases in solution until the casting has been run and is well on toward solidifying. When this point has been reached the sulphide sets the gases free, and these push themselves up through the casting, and thus we have the pinholes. The way to avoid pinholing is to use iron and coke which are low in sulphur. If there is sufficient manganese present, manganese sulphide will be formed, and this sets at a much higher temperature than does sulphide of iron, and so by one or other of these means pinholing is avoided.

Liquid and Solid Contraction.

I now come to the consideration of what in England is called "sinking" and in Scotland "drawing." The longer but more accurate term "liquid contraction" was suggested by Longmuir. On this most important subject I can only indicate some of the conditions present when it occurs, and also some of the means for the prevention of it. What we do know is that liquid contraction is of surpassing importance to founders, and is the cause of the loss of hundreds of thousands of pounds annually. Liquid contraction does not show sign of being present when a casting is regular in form and is all of one thickness, unless possibly it may show signs of this near the runner.

There is little doubt that these two forms of contraction, the liquid and the solid, are closely related as regards occurrence and extent—that is, the conditions which conduce to the minimum solid contraction are also those which conduce to a minimum liquid contraction. On the other hand, the conditions which conduce to a maximum solid contraction are also those which produce a maximum liquid contraction. This indicates some connection between the two phenomena. Cast steel has a greater contraction than a cast iron having low total carbon, and a cast iron with low total carbon has a greater contraction than one with high total carbon. Quantity of carbon has thus an influence in determining the amount of contraction. The condition of the carbon also has an effect upon both forms of contraction. A white iron contracts more than a gray iron, graphite being absent from the former. Carbon in combination with iron—that is, in the form known as combined carbon—has practically no more influence in reducing contraction than if it were absent altogether. The condition of the carbon is thus a determining influence on the amount of contraction, both liquid and solid.

If one took, say, 3 cwt. of ordinary gray iron, and ran it into a pipe 9 ft. long, the solid contraction would be about $\frac{1}{4}$ in. per foot of length. If this iron had been run into a square block, the solid construction would be less than in the case of the pipe, but the liquid contraction would be evidenced by a "sinking" or drawing away of the iron which was last to solidify. The two contractions together, in the case of the block of iron, are no so great as the solid contraction alone in the case of the pipe, for the reason that the slow cooling of the block favors the more thorough separation of graphite. As we have seen, the more graphite there is the less is the contraction.

If a lighter part of a casting can draw liquid iron from a contiguous heavy part it will do so, and thus lessen its own solid contraction. Each part in turn borrows from the more fluid iron next it, and the part

which lends iron and cannot itself borrow exhibits what we term a "shrink hole," "sinking," or the better term, liquid contraction. Under the conditions mentioned, a heavy part lending liquid iron and not being in a position to borrow, it is the business of the skillful foundryman to supply the deficiency by "feeding." This is neither more nor less than replacing iron which the heavy part has been called upon to give up to lighter sections which, in the absence of such a supply, would have an increased solid contraction. Some foundries use irons with high total carbon, and with well proportioned castings "feeding" is exceptional. Freedom from liquid contraction is thus obtained by all parts of the casting setting at the same time, and the contraction is normal owing to the quantity of carbon available for turning into graphite.

Most foundrymen are agreed that a casting run with "dull" iron does not so readily "sink" or "draw" as metal which is run hot—that is, the liquid contraction is less with the iron which is lowest in temperature. The ability of molten iron to keep carbon dissolved within it is very largely a matter of temperature. The lower the temperature the less readily can the iron hold the carbon in solution. When iron is pretty fully saturated with carbon a slight fall of temperature and a jumbling of the metal, such as takes place when carrying a ladle, suffice to liberate some of the carbon as "kish." So in pouring iron at a low temperature the act of pouring assists the liberation of the carbon as graphite in greater proportion than when cast hot.

The conclusion is that both liquid and solid contractions depend almost wholly upon the quantity of carbon which takes the graphite form. This is absolutely so as regards gray hematites, and in the case of ordinary foundry irons is only to be qualified by taking account of the slight expansion due to the solidification of the phosphorus eutectic.

The considerations stated and conclusions drawn may apply preferably to gray irons and yet not be wholly applicable to irons low in total carbon, silicon and manganese. In such irons it is possible oxide of iron plays a part, but as yet there is no actual proof of this.

Test Bars and the Time Element.

The influence which the duration of the time of cooling has upon the structure and, therefore, upon the strength of the material calls for consideration. There comes into play what I call the "time element"—that is, when the sulphur is normal, time and silicon may take the place of each other. By slow cooling, under special conditions designed to that end, Hiorns produced a gray iron containing well defined graphite, although silicon was practically absent. When making up mixtures for castings, and especially for those which are subject to being accepted or rejected, according as the test bars do well or ill, this interchangeability of time and silicon has to be taken into account. In other words, if the casting will cool quickly, then the silicon has to be increased. If the casting cools slowly, then the silicon is decreased. I think many of the failures of test bars attached to large castings are due to the silicon being too high. This, combined with the slow cooling, allows the graphite to grow too large, both in size and in percentage. A large granular structure also develops, and with these conditions present low tests are obtained, followed by the rejection of the castings. Greatest general strength is obtained when the combined carbon is 0.6 per cent., or a little over that amount. So when that percentage is to be obtained, whether the test bar is cast separately or attached to the casting, then the percentage of silicon necessary in each case should be used. When one considers that the combined carbon of 0.499 per cent. in a test bar separately cast many drop to 0.101 per cent. in the heavy part of a casting, although run from the same metal, it follows that if the test bar is attached to and run from the casting something must be done if we are to get the proper structure in the test bar so that it may stand the proper test. An open granular structure will not give a good test; a close structure with the graphite in a finely divided condition will give good tests if the phosphorus be under 0.4 per cent. Whenever you get large flakes or plates of graphite and large crystals of

iron the fracture takes place through the plates of graphite and along the boundaries of the crystals. When a strong iron is broken the microscope reveals the fact that such irons have the graphite in a finely divided condition, the iron is not in well defined crystals, and the structure is largely what one may call confused.

Some of my best tests were with irons containing 14 cwt. of scrap and 6cwt. of pig iron, but when using such a large quantity of scrap care should be taken that the sulphur is neutralized by a sufficiency of manganese.

The Wemlinger Steel Sheet Piling.

Among the types of sheet piling that are formed from steel sheets perhaps that which has received the most extended application is the corrugated sheet piling of the Wemlinger Steel Piling Company, 11 Broadway, New York City. Steel plates being obtainable in a great variety of thicknesses, it is possible to produce finished piling in corresponding variety, which enables engineers to use precisely the strength of piling actually demanded by the work.

This style of piling consists of vertically fluted or corrugated sheets, a form of very considerable strength for the weight of material used by virtue of the stiffness imparted by the flutings. This stiffness is important not only during the driving, but subsequently to perform the proper functions. The disposition of metal in the form of corrugations is one of the best possible. A comparison made by Mr. Wemlinger in this connection is to the following effect: The minimum radius of gyration of a

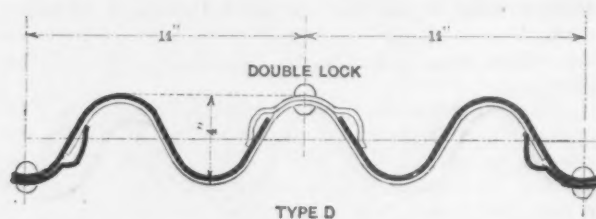


Fig. 1.—Cross Section of Wemlinger Steel Sheet Piling with Center Interlock.

24-in. I-beam, $7\frac{1}{2}$ in. deep, with a web $\frac{3}{4}$ in. thick, is 1.28 in. A corrugated steel section also 24 in. wide, having a 4-in. depth of corrugation and of metal 3-16 in. thick, has a least radius of gyration of 1.42 in.—that is, the corrugated section, one-fourth the weight of the I-beam, is 10 per cent. stiffer.

In driving the corrugated section if a large boulder is struck the material of the pile at the foot or top or both may be upset, but the body of the pile is too stiff to buckle. This freedom from buckling is important, as a buckled section is quite likely to involve adjacent areas of the sheet piling and to make it impossible to withdraw the piles when that is desirable. Any sheet pile drives better if its section is symmetrical—i. e., without preponderance of weight in some particular direction. The corrugated sheet pile is symmetrical in weight, except for the inconsiderable weight of the locking strip. As this strip is shorter than the pile it does not encounter much resistance in driving and is in little danger of damage. Under exceptional conditions the strip may be threatened from the side, but this is ordinarily disregarded. Sometimes in driving sheet piling of any interlocking variety it becomes desirable to vary the amount of clearance in the interlock. With the corrugated sheet pile this is readily done and without rendering the interlock ineffective.

Not only may the thickness of the corrugated pile be made anything desirable, but its other dimensions may be readily varied. Its width, for example, may be made to suit particular conditions, and the stiffness desired may be obtained by selecting the proper depth of corrugation. As this depends but inconsiderably upon the thickness of the metal, it will readily be seen that this property may be varied without correspondingly varying those properties which more particularly depend upon the weight of the sheet steel used. Further, it is possible

to use this style singly or doubly—that is, a single thickness may be driven, or, if the local conditions require it, two or even more.

The Design of the Piling.

A cross section of this piling is shown in Fig. 1. This particular style consists of five single corrugations

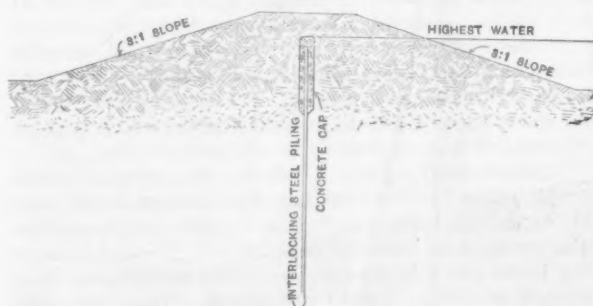


Fig. 2.—An Earth Levee with Sheet Piling Reinforcement.

or two and one-half double ones. The depth is about 4 in. and the width of the entire section about 2 ft. The locking clip consists of a longitudinal strip riveted upon the exterior of the central corrugation. Extending laterally to each side, it envelopes the edges of the adjacent sections. It will be noticed how the folds of one section duplicate nearly one-half of those of each of the adjacent sections. In fact, if the locking strip is taken into account, the piling consists of a double thickness of metal throughout. The form of the corrugations is partly cylindrical and partly planar. Each single corrugation consists, in transverse section, of one-third of a circumference. These thirds are joined by flat portions. The thickness of metal in both the body of the pile and in the locking clip is the same. To form such a 2-ft. section, 4 in. deep, the width of plate required varies with the thickness. Thus, if the plate be 3-16 in. thick, a width of $34\frac{1}{2}$ in. will be required; if $\frac{1}{4}$ in. thick, 34 in.; if 5-16 in. thick, $33\frac{1}{2}$ in. Increase in thickness is accompanied by a slight decrease in the width of the blank plate. The width of plate used for the locking clip is the same for all three sizes— $7\frac{1}{2}$ in. When finished with this strip in place a 20-ft. section will weigh about 936, 1228 or 1508 lb., according as the thickness is 3-16, $\frac{1}{4}$ or 5-16 in. The average weight per square foot may be found by dividing these weights by 40 (the number of square feet of effective area of the pile).

As this piling overlaps, allowance must be made when calculating the amount of piling needed for a particular installation. From Fig. 1 it will be noticed that the linear distance covered from rivet line to rivet line is

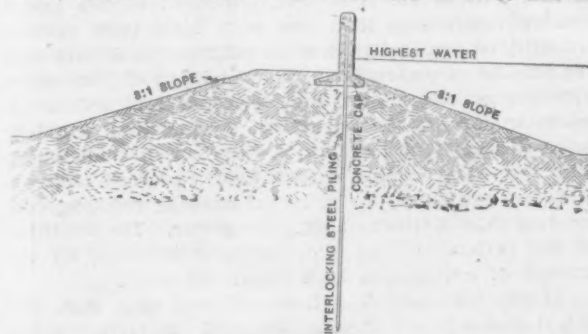


Fig. 3.—Another Reinforced Levee with the Piling Projecting, Forming a Wall.

about 14 in. One-half of one section and one-half of another is thus used to cover this length. That is to say, it will require a width of 24-in. of piling to cover, linearly, 14 in. of the work. As 24 is 1.43 times 14, by multiplying the number of linear feet of the work by 1.43 the number of piles needed will be obtained. This rule only applies to straight work, takes no account of particular conditions at the ends (whether there is waste or not) and has reference to a rivet distance of 14 in., with 2-ft. piles. However, the principles are illustrated.

When piling arranged, as in Fig. 1, is in place, the

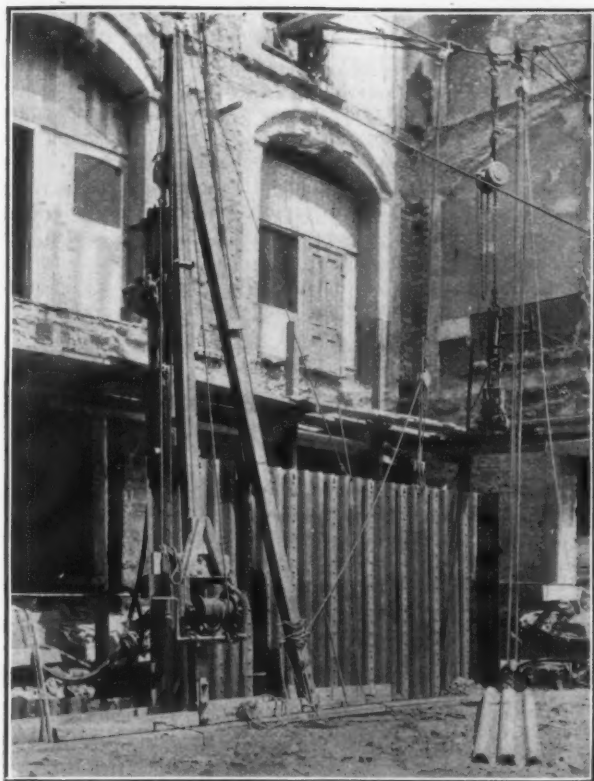


Fig. 4.—Manner of Driving Wemlinger Corrugated Sheet Piling.

weights per square foot are also to be increased by 43 per cent. to obtain the weights actually employed in covering a square foot of surface of the work. These weights are respectively 23.4, 30.7 and 37.7 lb. Consequently the actual weights of metal required to cover a square foot of surface are 33.5, 43.9 and 53.9 lb., respectively. For these weights there is a thickness of $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{5}{8}$ in. of steel practically everywhere.

Protection from Corrosion.

An important consideration in connection with any form of steel or iron sheet piling for permanent work is corrosion, especially because of the comparative thinness of the metal. Fortunately iron does not corrode when submerged in water unless also exposed to air, and in the atmosphere it does not corrode unless water reaches it. The presence of many impurities tend



Fig. 5.—Driven Piling Showing How Corners Are Turned.

to accelerate corrosive action. However, if iron can be hermetically sealed so as to be beyond the reach of water, we have one solution of the problem of rendering it noncorrodible. Again, if submerged iron can be guarded against entrained air, success may likewise be expected. Imbedding iron in properly made concrete seems to be very effective and to afford what there is very good reason to expect will prove a practical solution so far as unsubmerged construction is concerned. At depths varying according to local conditions, water contains but a small amount of air, and so iron objects sufficiently submerged may pretty confidently be expected not to corrode. A full knowledge of corrosion and practical means for its prevention is yet to be acquired, but many engineers are staking a great deal upon the adequacy of the protection afforded to steel by surrounding it with concrete. The very extensive practice of reinforcing concrete by imbedded steel, the permanence of which depends largely upon the effectiveness of the concrete covering, has revealed much, so that it is not much of a departure to cover steel with concrete to protect it from corrosion. It remains for time to give an absolutely conclusive demonstration of the noncorrodibility of steel imbedded in modern concrete.

Permanent Construction.

Examples of permanent construction based on the foregoing considerations are shown in Figs. 2 and 3. A bank of earth such as a levee not only must withstand the horizontal thrust of the head of water against it, but it must be protected against the forming of a hole through it either by the action of the water itself or by burrowing animals. Such a hole once started could rapidly enlarge by the flow of water through it to the

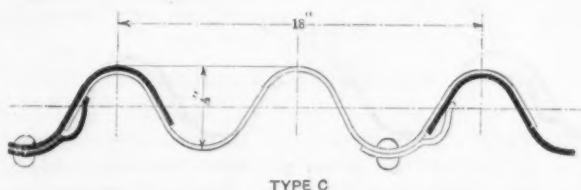


Fig. 6.—Cross Section of Wemlinger Sheet Piling with Edge Interlock.

ultimate destruction of the embankment. Therefore, when a dam or embankment is built the possibility of percolation through and under it must be considered. The curtain wall is the solution of this problem. It may be of masonry; it may be a trench filled to the width of 5 ft. or more with clay puddle; or it may be a wall of sheet piles. The expense and difficulty of the masonry and clay construction are evident. Wooden piling may be used, if it is entirely submerged at all times. It has, however, been found difficult to make it watertight. It is here that the best of the interlocking steel sheet piling are effective. A steel wall offers serious resistance to the teeth of the animal. Even if a small hole be cut through, it is not subject to serious enlargement either from the animal or from a water current, and the steel sheeting may be made very nearly watertight. The especial advantage over wooden piles is that steel forms may be driven readily and obtained in any lengths.

Fig. 2 is a section of a curtain wall introduced along the axis of a levee. The upper portion is protected by a concrete cap, extending well below where percolating water would contain free oxygen or air. In Fig. 3 is another form of curtain wall, which not only shuts off percolation, but forms a wall against high water. This arrangement of concrete cap and wall of steel was employed by the United States Government, as was described in *The Iron Age* September 24, 1908, in the Fort St. Philip sea wall. This last is a prominent example of steel sheeting used for permanent construction.

In Figs. 4 and 5 are shown views of the use of the Wemlinger corrugated steel sheet piling in connection with the reconstruction of the old Custom House on Wall street, New York City, into the new quarters of the National City Bank. The simplicity of the pile driving mechanism is well shown in Fig. 4. The question of



Fig. 7.—Wemlinger Piling in Sewer Construction.

turning a corner is apt to be quite a difficulty with sheet piling. But the readiness with which the Wemlinger form adapts itself to this necessity is well shown in Fig. 5, where two corners are in view.

Temporary Construction.

The Wemlinger corrugated pile is made in another form where the interlocking clip is not centrally placed and the wall of steel is not entirely of double thickness. In many situations—particularly where temporary construction only is intended—the interlocking clip is placed on one side, as shown in Fig. 6. There is sufficient overlap to secure a moderately good interlock. An example of the use of this single thickness form is shown in Fig. 7, a view of a section of sewer construction at Summit, N. J. The sewer excavation was 8000 ft. long and ranged in depth from 9 to 22 ft. In this work 3200 sq. ft. of Wemlinger steel sheet piling type A was used and re-used 100 times.

In driving the corrugated piling a 2500-lb. drop hammer is found effective, although a 3000-lb. steam hammer is preferred, as with a steam hammer the blows are so rapid that the penetrative effect is practically continuous. If an obstruction is encountered the driving may be persisted in without irreparable damage until its impenetrability is established. It may then be necessary to rearrange the line of sheeting at this point. A small boulder may be displaced if the surrounding earth is not too incompressible. If hard driving is necessary for any reason, the head of the pile may be protected by a suitable cap. The expense for driving is said to be about 75 per cent. of that for wooden piling.

The service of sheet piling in temporary work is very important. If a pipe line is to be laid through a marsh or is to be sunk in the bottom of a stream, two lines of sheet piling may be driven to form the walls of the trench and the included material removed by digging and pumping, to allow laying the pipe. Watertightness is highly desirable, and here the corrugated pile is conspicuously advantageous. As shown in Fig. 1, the overlap is so extensive and so involved that a very effective joint is made. If the material encountered is clay, it helps seal the joint.

A 42-in. steel pipe was laid across a body of water at Morgantown, Pa., by using a very light style of the corrugated piling. Two rows of light sheeting—weighing only 7½ lb. per sq. ft.—were driven until the middle of the strip of water was reached. A short line of piling was then driven to connect the two original lines to

make a kind of cofferdam. The water was pumped out and the soil excavated to the proper depth. About one-half the pipe was then laid, the piling withdrawn and the operation repeated for the remainder of the distance. The material excavated on the inside of the cofferdam was thrown out alongside and assisted in keeping the interior free from water. In such cases as these, where the piling is light and the depth moderate, the driving may be performed by a very small hammer, operated either by steam or compressed air. The man controlling this device adds his weight to that of the machine to the head of the pile being driven. The rapid blows of such a little hammer, weighted thus with the operator, are very effective in driving light sheeting.

The Standard Pressure Alarm Gauge.

The Standard pressure alarm gauge illustrated embodies improvements in the design and construction of a pressure gauge having a pointer, which makes contacts when predetermined pressures are reached. At the same



Fig. 1.—The Standard Pressure Gauge with High and Low Limit Alarm.

time the instrument serves to follow the pressure up the scale even after the alarm pointer has reached its contact and stopped.

As seen in Fig. 1, set behind the scale for indicating pressure is a hard fiber alarm dial bearing the high and low contact clips, set in this reading at 15 and 120 lb. The clips are adjustable, and may be set at any points on the scale by unscrewing the front of the gauge and slipping the contacts around on their curved contact

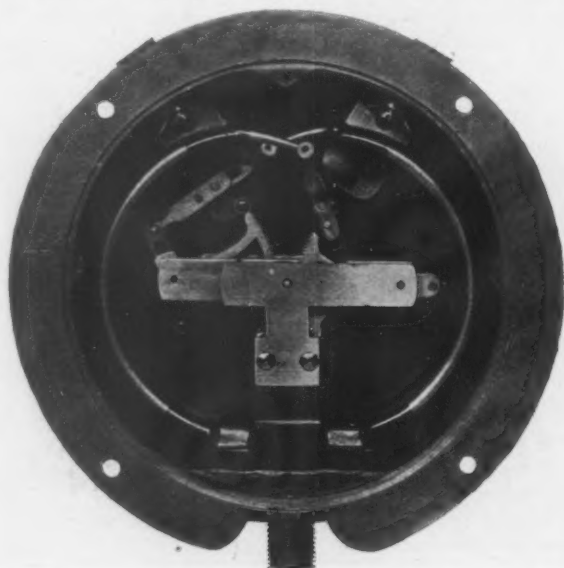


Fig. 2.—Back View of the Gauge Showing Mechanism.

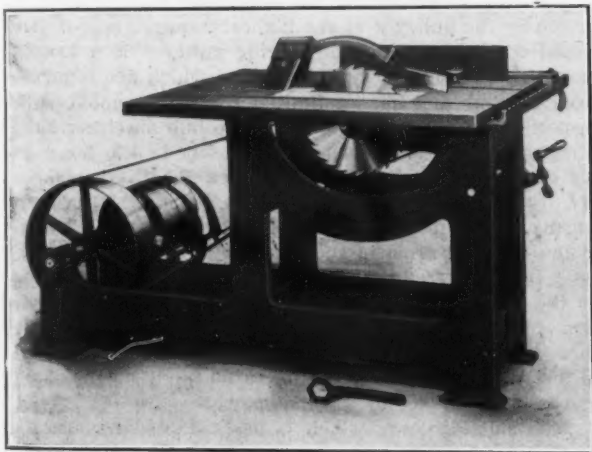
rods, which are electrically connected to binding posts at the top of the case, two of which are shown. A third binding post, the common return, is electrically connected to the alarm pointer through the case and movement.

Fig. 2 is a rear view of the instrument, with the back of the case removed. It will be seen that there are two independent pressure tubes and movements, one actuating the indicating pointer, the other the alarm pointer. They are supported by the same mounting and there is but one pressure connection, so that only one pressure transmission pipe is necessary. This independence of action prevents interference with one pointer by the other and consequent impairment of accuracy, and also, as already stated, enables the indicating pointer to accurately follow the pressure up the scale even after the alarm pointer has reached its contact.

The gauges are made in the 5-in. dial size, with brass or iron cases to match other gauges or switchboard equipment. It can be furnished for any pressures. The instrument is manufactured by the Standard Gauge Company, for which the Industrial Instrument Company, Foxboro, Mass., is the selling agent.

Silver's New Saw Table.

A machine that will particularly appeal to the operators of small pattern shops or wood working shops because of its comparative inexpensiveness, due to its simplicity, is the new saw table made by the Silver Mfg.



A New Saw Table Made by the Silver Mfg. Company, Salem, Ohio.

Company, 317 Broadway, Cleveland, Ohio. As shown in the illustration, the machine is equipped with a safety guard and pivoted auxiliary frame for vertical adjustment of the saw. The machine is adapted for fine and accurate service, but at the same time, being exceptionally rigid, is amply strong enough for rougher and heavier work found in all wood working shops. The table is iron, in one piece, strongly ribbed and planed smooth on the top. Two screws extend its length, one on each side of the saw line, to receive the sliding miter gauge. The table is stationary and machined, and is firmly bolted to the solid frame. It has a wooden throat piece, removable for grooving. Grooving heads up to 2 in. wide may be used.

The frame is symmetrical and has its weight so distributed that vibration is minimized. It is cast in one solid piece. The saw arbor or mandrel is carried on an auxiliary frame beneath the table, and its vertical movement is regulated by a hand wheel operating on a segment gear. The saw remains at any level without locking. The arbor is 24 in. long and 1½ in. diameter, and is supported by two wide, well babbitted bearings with journal caps to adjust for wear. The pulley on the arbor is machined all over.

The saw is 12 in. diameter and when raised projects 3 in. above the table. It is easily removed by lowering the arbor frame. Saws up to 14 in. diameter can be used. A boring bit or chuck can be fitted to the rear

end of the arbor. The journal bearings on both the saw arbor and the countershaft are long, heavily babbitted, and are made with caps to take up wear. They are fitted with dust-proof, self-closing oilers.

The fences are entirely of metal, machined and fitted. The ripping fence tilts to any angle up to 45 degrees, and is held rigidly by the hand wheel. It opens 18 in. from the saw; the width of cut is indicated by a scale. The fence can be fastened by a clamp at any point, or can be removed entirely to leave the table clear for special work. The guard over the saw is of metal and is attached to the table and provided with a safety dog, which serves to protect the operator from injury. This is a feature claimed not to be found on any similar machine. The belt shifter is controlled from a point easily accessible to the operator, and has a device to prevent the belt from creeping back from the position in which it is set. The countershaft is equipped with tight and loose self-oiling pulleys 10 in. diameter by 5 in. face, and intended to run at 650 rev. per min. to give the saw a speed of 3000 rev. It is 30 in. long and has a steel shaft running in long bearings on a rigid stand. The following are the principal dimensions of the saw table:

Floor space.....	41 x 66 in.
Height of table.....	32 in.
Size of table.....	31 x 38 in.
Size of mandrel for saw.....	1½ x 24 in.
Size of mandrel hole for saw.....	1 in.
Diameter of saw.....	12 in.
Distance from the saw to the fence.....	18 in.
Vertical travel of the saw above the table.....	3 in.
Journal bearings on mandrel and countershaft.....	4 in. long
Weight, crated.....	825 lb.

The regular equipment includes a 12-in. saw, either cut-off or rip type, a cut-off fence, a ripping fence, a nut wrench for the mandrel and a safety guard for the saw.

The Philadelphia Foundrymen's Association.

The 188th meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club on the evening of September 1. This was the first meeting after the summer recess and was quite largely attended. Applications for active membership from the Philadelphia Roll & Machine Company, Philadelphia, represented by Alfred Cook, and the Carborundum Company, Niagara Falls, N. Y., represented by Charles Nicholson, 602 Arch street, Philadelphia, were favorably acted upon and they were duly elected members of the association.

After the transaction of routine business reports were received from the various foundrymen present in reference to the conditions of business as they now find them. The consensus of opinion was that there has been a decided improvement in the foundry trade. The textile machinery manufacturers are, in a number of instances, operating at double the capacity of last year and fully up to the basis of 1907. General jobbing foundries reported decidedly improved conditions, but prices are, in many cases, not as good as they should be. There is, however, a tendency toward a higher level, and with many better prices are being obtained for new work.

The reports from stove manufacturers showed that business is improving, although not as rapidly as desired. A very marked betterment was reported by sash weight manufacturers, with prices steadily improving. The steel casting trade noted a better volume of business, and the outlook for the future is believed to be much more favorable. Foundries operating in connection with railroad repair shops have increased their production very rapidly; in one instance it was reported that the tonnage of brass and iron castings produced had increased 30 per cent. over that of a month ago. Brass foundries doing largely jobbing work report prices very unsatisfactory. The demand for machinery and engine castings was reported as very much better, and the outlook for a larger volume of business is considered exceptionally good.

On the whole, the situation appears to be improving, with a tendency toward a larger production and better prices. Following adjournment, luncheon was served in the dining room of the club.

The Hawkeye Variable Speed Countershaft.

Interesting among the various devices which have been brought out to afford variable speeds in the driving of machinery without depending upon the shifting of belts on cone pulleys is the variable speed countershaft recently introduced by the Hawkeye Mfg. Company, Cedar Rapids, Iowa. In principle it is one of the simplest contrivances ever produced, depending for the va-

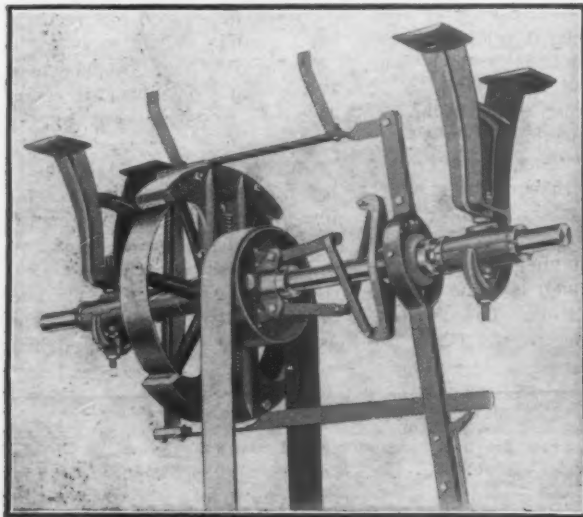


Fig. 1.—A Variable Speed Friction Clutch Pulley Countershaft with Lever Control, Made by the Hawkeye Mfg. Company, Cedar Rapids, Iowa.

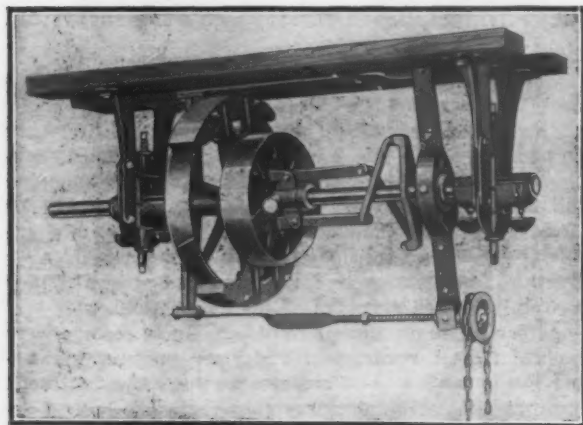


Fig. 2.—A Hawkeye Variable Speed Countershaft with Hand Chain Control.

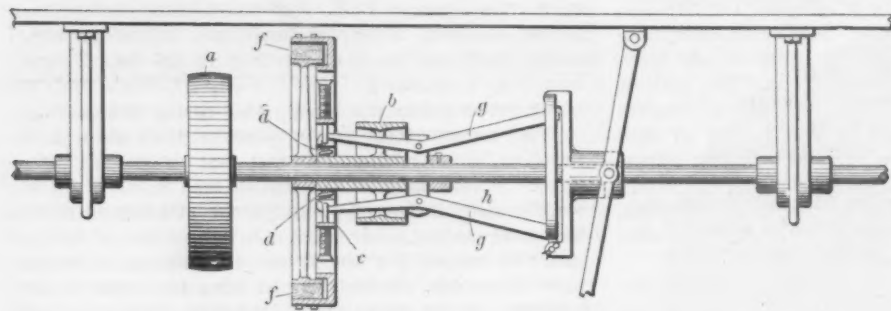


Fig. 3.—Longitudinal and Cross Sections of the Mechanism of the Hawkeye Variable Speed Countershaft.

riation of speed on a greater or less amount of slipping in the frictional contact between the constant speed driving pulley and the shoes of the spider carrying the driven pulley. Without question it lacks the positiveness of any geared or chain-driven transmission, but since between a source of power and its delivery there is usually at least one belt and therefore a place where slipping can occur it can hardly be considered to be a serious matter. At first glance and to one who has not seen it in operation, the criticism that would naturally

suggest itself is that such a means of transmitting variable speeds could scarcely be capable of insuring a uniform speed at any one setting. It is claimed, however, that uniform speeds are obtained, the reason for which is that the elements of the centrifugal governor are to be found in the mechanism which effects the contact between the shoes and driving pulley. After any change in speed an equilibrium is quickly established between the opposing forces of centrifugal action acting upon the shoes and compression springs.

Most simply expressed the essential part is a friction clutch of the drum and brakeshoe type with regulatable contact controlled by a lever as in Fig. 1, or a sheave wheel with drop chain, as in Fig. 2, with which the pressure of the shoes on the wheel face can be nicely regulated. Not only is the use of a step cone pulley done away with, but tight and loose pulleys are also eliminated, for when all contact is released between the wheel and shoes the machinery driven stands idle. Unlike gear change devices, but in common with other but radically different forms of frictional variable speed drive, this one gives a continuous range of speeds between maximum and minimum, that is, any speed between these limits is possible and not simply changes of speed by steps.

From the accompanying illustrations an idea of the form and mechanical details of the clutch pulley may be had. Figs. 1 and 2 show the method of installing with a lever and with sheave wheel attachment, respectively, for applying and releasing the clutch. Longitudinal and cross sections of the mechanism are shown in Fig. 3. Referring to the latter the countershaft is driven by the pulley *a* at the highest required speed. Integral with the hub of the driving pulley *b* is a loosely mounted spider *c*, the radial arms of which are separate from the hub and have a limited radial movement with respect to it. Two studs *d* set in the hub on either side, carrying compression springs, fit loosely in the holes in the ends of the radial arms to which the friction shoes are attached. These springs tend to force the arms outwardly, which movement is limited by the strap *e* bolted to the hub and arms in such a manner as to allow sufficient travel to free the shoes from contact with the face of the friction pulley. Eye bolts mounted on compression springs are located near the center of each arm. To these are fastened the ends of levers *g*, which are pivoted to the fulcrum yoke. The latter turns freely on the shaft and is held in place by a collar, *h*.

The shifting lever which is best adapted for use on machines where instant stopping is desired is held at any given point by a rack and ratchet, as shown in Fig. 1. Following the cycle of operations it will be noticed that on moving the shifting lever to the right the tension of the compression springs is relieved, whereupon centrifugal force acting upon the radial arms releases

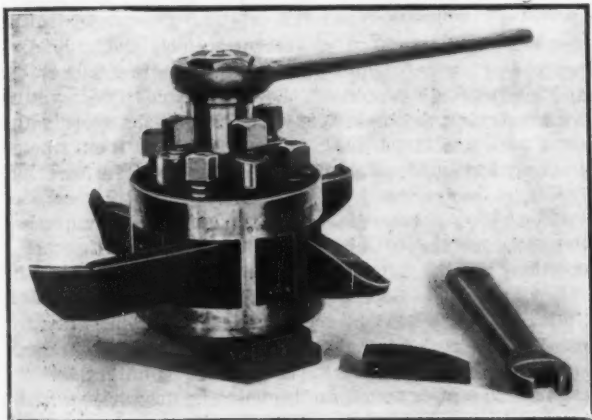
the grip of the friction shoes. So long as this inward tension is great enough to compensate for slipping due to work resistance and centrifugal influence, the speed of the driven pulley will be evenly maintained. Thus to secure an equilibrium of all forces at any speed ratio it is only necessary to shift the lever to the right or left, according to the results desired.

The pulley is made in standard sizes, ranging from 1 to 12 hp. It is not only furnished for use in connection with countershafts, as in the cases illustrated, but

is also made to be used as a friction pulley in any transmission where a uniform speed is desired, and is set by means of screws or nuts and not intended to be changed except when the machine is stopped. Such a transmission is useful in connection with gas engines driving generators to give the uniform speed required, particularly for lighting loads.

The Brewer Multiple Tool Holder.

The multiple tool holder illustrated is useful in machine shops, when turning out duplicate pieces with from two to four operations on each. It holds four tools and can be used on chuck work for boring and turning, or the turning on centers of studs, pins, &c., the threading of long shafts, and almost any work requiring more than



The Brewer Multiple Tool Holder Made by the Multiple Tool Holder Company, Cleveland, Ohio.

one operation. The device has been recently patented by the inventor, F. J. Brewer, and is being manufactured by the Multiple Tool Holder Company, 3197 West Forty-eighth street, Cleveland, Ohio.

The tool holder practically converts an engine lathe into a turret lathe, and is made so that it can be easily and quickly attached and detached. It is made to fit the T slot or the slot where the regular tool post fits on the cross slide of the lathe. Two set screws hold it fast, so that even when the tool holder is not tight, the part that fits into the T slot will not move. The same piece has index pins, one on each end, operated by springs, which operate in threaded casings and are screwed into the bottom piece that fits the T slot. The corresponding index plate has eight index holes, giving all 45 and 90 degree angle positions. The index plate is dowel pinned and screwed to the bottom of the holder.

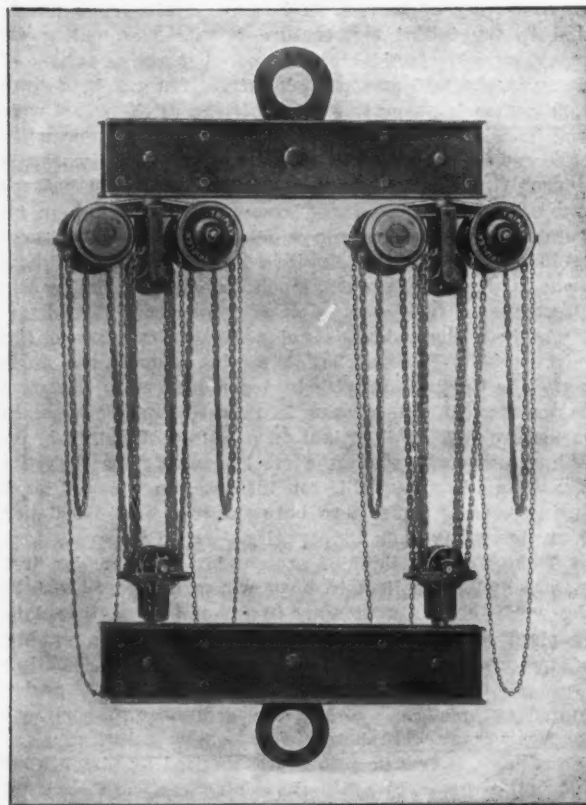
The complete index system is tool steel hardened, and the holder is a steel casting. All tools are adjusted up and down by the ordinary shoes or wedges, one of which is shown removed in the illustration. Each tool is held down by two set screws, tool steel hardened, and is held off center in the holder, as shown. The tools can be pointed in either of two directions—as indicated, or at right angles to those positions. When the holder is adjusted to the lathe the index is so adjusted that when the center clamping nut is given one half turn it releases the tool holder from its locking position and allows it to turn freely. The multiple tool holder can be made to fit any lathe.

The cotton crop, according to the experts of the Department of Agriculture, will be the smallest in many years. Its condition on August 31 was only 63.7 per cent., as compared with 76.1 per cent. at the same date last year. It will not amount to more than 10,250,000 bales, whereas last year the yield was 13,587,306 bales of 500 lb. Not since 1903 has the crop been so small, although 1905 showed only 500,000 bales more. The domestic consumption being now about 4,750,000 bales, the exportable surplus this year will probably be about 5,500,000 bales, against usual exports of at least 50 per cent. more.

A Yale & Towne 40-Ton Triplex Chain Block.

When one thinks of a chain block it is usually of one of a capacity ranging from the ½-ton differential to the 1, 2 or may be 5 ton blocks of higher efficiency. For some reason it is still common to regard a chain block of over 10 tons capacity as something unusual. It is nevertheless the fact that the larger sizes of chain blocks are just as available under certain circumstances for heavy loads as the differential is for light loads. The Yale & Towne Mfg. Company, Stamford, Conn., has regularly for years made its triplex chain blocks up to 20 tons capacity. The 40-ton triplex illustrated has recently been developed to meet the demands of engineers for a dependable hand hoist to handle very heavy loads where the installation of an electric crane or powerful steam hoist, because of time or cost, would be out of the question.

The 40-ton triplex is composed of two 20-ton units with equalizing bars at top and bottom. This provides for single point suspension and a single point for attachment of load. The equalizing bars are made of two channels placed back to back with separators. Provision is made for the swiveling of each unit at top and bottom. The clevises or points of attachment enable the user to easily put the hoist in place wherever used and



A 40-Ton Hand Hoist Embodying Two 20-Ton Triplex Chain Blocks, Made by the Yale & Towne Mfg. Company, Stamford, Conn.

also afford a convenient point for the attachment of the load.

It will find its greatest fields of usefulness in wrecking work (especially marine, in manufacturing plants, at mines and quarries and in building operations, and generally for loading and unloading. It may be installed over railroad tracks on a properly guyed temporary or permanent trestle. Lateral motion may be secured by one or more trolleys running on a large I beam. It is available also for handling heavy ordnance, &c., where head room, cost, infrequency of lift, or other conditions do not permit the use of power cranes of sufficient capacity. The hand chains are arranged to permit two, four or eight men to work effectively. Where the load is larger than 40 tons it is generally of sufficient size to permit two of these hoists to be worked together, giving a capacity of 80 tons.

Electric Control for Rolling Mill Motors.*

BY C. T. HENDERSON.

Much has been said regarding the remarkable electrical applications during the last few years in connection with the iron and steel industry, but only those directly interested in this work realize how much impetus has been given to it by the development of suitable controlling apparatus. When A. C. Dinkey, then chief electrician of the Carnegie Steel Company's Homestead Works, installed the first electric motor for roll table service in 1893, he naturally used the standard apparatus of the day, and quite naturally it failed. He immediately sought for something better, especially in controlling apparatus. At that time the only service comparing in severity with that encountered in rolling mills was in electric railroad practice. Accordingly, the railroad motor was rewound for 250 volts and placed in service. In controllers not even temporary satisfaction was found in the devices available, so Mr. Dinkey developed a simple rheostatic controller of the face plate type. This controller, or one similar to it, together with the rewound railroad motor, supplied the demands for about 12 years. Meantime, however, it was found that mill service was much more severe than railroad service—more severe in the number of starts and stops per hour, in continuity of service, in lack of intelligent handling and in the initial temperature of the surrounding atmosphere. It should be said, too, that the penalties of delay in the mill are much higher. If a car in a traction system is put out of service it can at the worst wait and be taken to the car barn by the following one without causing essential money loss. But a steel works is unusual in being a manufacturing plant in which there is no reservoir. The material must pass through in an uninterrupted stream; for a delay at any point breaks up the process all along the line, resulting in the derangement of the entire system, much spoiled steel and consequent loss.

Again a steel plant is unique in the relation of the initial cost of the installation to the value of the product. The Gary plant, with its large and costly electrical equipment, can roll a value in finished product equal to the entire cost of the plant in a couple of months. So it has come to pass that a steel plant figures that the loss of a blooming mill, for instance, in time of good business, costs somewhere between \$300 and \$1000 per hour, depending upon its capacity.

Though in the light of present-day practice the first motors and controllers in steel works were unsuited to the work they grew steadily in favor, and continued to supplant steam auxiliary apparatus. But as the number of motors increased the dissatisfaction with existing types of controllers increased correspondingly. Series wound motors with a torque almost directly proportional to the current were hardly satisfactory substitutes for steam engines (whose torque was limited by piston area and boiler pressure) when the controllers were operated by ignorant and often vicious persons. To remedy this defect in the operating conditions, about the year 1900 various devices appeared for properly controlling the motors. Lack of ruggedness caused most of these devices to fail, and it was not until about 1903 that really serviceable apparatus of this nature came into use. From the start the necessity for current limit control was recognized, and apparatus was designed to make the period of acceleration dependent on the current supply to the motor, the control system being an organization of magnetically operated switches, whose details left much to be desired on account of the steel mill practice of making repairs on Sunday. At first the demand was for a controller made up of switches rugged enough to operate continuously for six days; this was produced late in 1903. Soon there was a demand for a switch more rugged and more susceptible to quick repairs when repairs were needed. Apparatus of this nature was produced in due time.

It has been said that the necessity for current limit

control was recognized very early. The first systems employed were far too complicated. Further, they were adapted to maintain the accelerating current at an approximately constant value. In many instances this is undesirable; for instance, where motors are reversed while in rotation, the high armature reaction makes them incapable of commutating current that could be commutated safely when starting from rest. Again, as the motor comes up to speed its commutating limit falls off. This is taken care of in modern controller practice by having a multiplicity of current relays, one associated with each accelerating switch, so that the current can be adjusted independently at each point in the cycle.

Control System for Ore Unloaders.

Starting at the docks where the ore is unloaded and shipped to various steel plants, we find one of the most spectacular machines in the steel industry, the Hulett unloader. This machine was originally steam-hydraulic operated, and has been successfully electrified only during recent years. The operator rides in the bucket leg and controls all motions of the unloader. The walking beam carrying the bucket leg must be started smoothly and quickly when the bucket has been filled, then slowed down and stopped automatically at the top. In lowering, the hoist motor must be transformed into a generator and serve as a retarding means. At the bottom, when the operator throws his master controller to the "off" position, the beam must be brought to rest quickly and smoothly. This is accomplished by the same current limiting devices used in acceleration. So perfect are the results obtained that riding in the bucket leg reminds one of a trip in a hydraulic elevator.

The bucket, which handles 10 tons per trip, can be rotated so as to pass between hatches; and automatic control of this motion serves to limit the rotation to seven-eighths turn either way from the normal position. The bucket having been rotated 90 degrees, it is easily seen that if it should get caught on a staunchion while closing, the enormous side strains would be thrown on the supporting beam. This distinctly calls for current limit control of the highest order. Since such apparatus has become available, it is possible to reduce the weight of the machine 15 per cent. by reason of the elimination of these extraordinary strains.

During the present season four such machines of 15 tons capacity per trip are being installed. Aside from their huge size they have many interesting features. They are made to span five railroad tracks, and carry a weighing larry that runs across these tracks. The bucket conveys ore from the hold of a vessel into a hopper, from which it is drawn into the larry and weighed. From the larry it is dumped into railroad cars, being weighed by subtraction on specially constructed scales during the process. Thus the cars are loaded and weighed without the necessity of first weighing the empties. Furthermore, each car is loaded to its capacity, a feature of great importance to docks whose daily tonnage is limited by the cars available.

In ore bridge practice the availability of proper controlling apparatus has brought about a change in design but little short of revolutionary. To-day in grab-bucket hoists in place of the single motor of 15 years ago, we have the double motor system, in which the drums are driven by individual motors, thus eliminating the friction clutches, and, by making the operator's physical task easier, increasing the capacity of a given plant. These same motors, equipped with current-limiting, dynamic-braking controllers, can be made to act as generators during lowering, thus retarding the downward movement of the bucket, and transforming the kinetic energy stored therein into heat in a rheostat. Here its conversion is not attended by mechanical abrasion, and hence the necessity for continual adjustments is eliminated. During the lowering operation the braking of either of the two motors can be varied independently, and thus the bucket made to open gradually, close gradually, or remain with the jaws at a fixed opening, as desired.

The Problem of Electrically Operated Blooming Mill Tables.

In the steel plants themselves the complete electrification of auxiliary machinery was not attempted until

* From a paper presented at the 26th annual convention of the American Institute of Electrical Engineers, Frontenac, N. Y., June 30, 1909.

some time after both controlling apparatus and motors had been brought to a condition closely approaching perfection. As late as 1905 steel plants were erected in which all auxiliary machinery (except the blooming mill tables and elevating mechanism in the case of three-high mills) was electrically operated. Gradually the prejudice against electrically operated blooming mill tables was overcome, but the elevating table mechanism seemed destined to remain hydraulic. When the problem presented is considered carefully, the hesitancy on the part of the mill owners must be acknowledged to be justified.

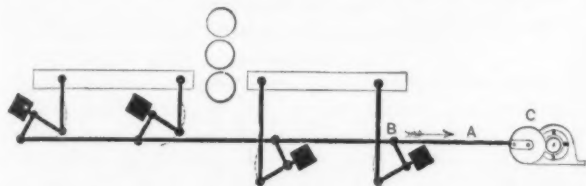


Fig. 1.—Diagram of Electrical Operation of Blooming Mill Tables.

The elevating tables referred to consist of live rollers which must be elevated or lowered between passes, first to admit the steel to the lower pair of rolls, then return it to the upper pair. The rolls are very heavy, seldom weighing less than 100,000 lb., and must be operated in very short periods. At last a steel plant was found which was building a new 40 in. blooming mill; this plant was willing to put in the electrically operated table mechanism, if it could be shown to be feasible. A careful investigation of the speed in other plants showed that the shortest period required by hydraulic equipments to raise or lower was 3 sec. To insure the table being fast enough the steel company's specifications required a complete cycle in 2.5 sec., apparently on the supposition that the equipment would not come up to specifications, and that by specifying a 2.5 sec. period they would insure operation in 3 sec. This table weighed 118,000 lb. and was required to rise a total distance of 40 in.

The arrangement adopted is shown diagrammatically in Fig. 1. The motor finally decided upon was 160 hp. at 88 rev. per min., geared to a crank at a ratio of 1:5.8. This crank is connected to four bell cranks carrying the table. The bell cranks also carry counterweights aggregating 89,500 lb., giving a total mass of 207,500 lb. to be moved. The ingot to be rolled weighs 10 tons, and the counterweights are so disposed as to counterbalance the table and ingot. Thereafter the problem becomes merely one of starting and stopping, but with enormous masses



Fig. 2.—Curve Illustrating Connecting Rod Movement in Electrical Operation of Tables.

and unusually short time-periods involved. If the connecting rod A were of infinite length, plotting the movement of point B in the direction of the arrow against the degrees of rotation of crank shaft C would result in a true sine curve, Fig. 2. Taking this curve as a basis, it is easily seen that during the first few degrees of rotation there is but little movement imparted to the connecting rod, and hence to the table. This being true, almost the entire starting torque of the motor is available for accelerating its own armature; and if it is accelerated before the curve begins to rise abruptly the full torque will then be available for accelerating the table and counterweights. At the top the table is decelerated by virtue of the shape of the curve, the full torque of the motor being again available for retarding its own armature. While the connecting rod used in actual practice is so long as somewhat to distort the rotation movement curve, Fig. 2, at the same time this curve is close enough to that obtained in practice for an understanding of the installation.

The first installation worked out very well indeed. The table rose in 2.4 sec., 0.4 sec. of this period being

required to accelerate and 0.4 sec. to stop, the motor operating at full speed 1.6 sec. Recording ammeter charts show that this is accomplished without the motor requiring more than full load current at any time. The controlling mechanism is entirely automatic, a movement of the operator's master switch causing the table to rise and automatically slow down, and stop, while a reverse movement causes it to lower automatically, slow down, and stop. Although there is a solenoid operated brake on the equipment, its time-lag is such that it never acts until the table has been brought to rest by generative action. The shape of the rotation-movement curve is again of value in that a few degrees of error in the stopping point, top or bottom, do not influence the position of the table to any extent.

The objection to the installation just described is the necessity for accelerating and stopping the counterweights at either end of the cycle, which adds considerably to the power required to operate. Therefore when the table for the blooming mill at Gary was designed, hydraulic counterweights were employed. The bell-cranks carrying the table are connected to hydraulic cylinders piped to the compression tank partly filled with air. When the table is down the air pressure in the compression tank over-counterweights the table by 25 per cent. When the table is up it is under-counterweighted by 25 per cent. This is accomplished by a proper proportion of air and water in the system.

The Gary Blooming Mill Table.

The Gary table moves 43 in., weighs approximately 250,000 lb., and makes a cycle in 3 sec. It is operated by a 250-hp. motor running at 100 rev. per min. Immediately after completion of the Gary table, an interesting test was made to determine how closely the acceleration curve followed a true sine wave. A board carrying a paper chart was placed on the side of the table, and an electric bell with clapper removed and a pencil substituted connected on a 25-cycle circuit and arranged to make dots on the chart. Connected on a circuit of this frequency, it would make 50 dots per second. The distance between dots served as a guide in the compiling of a curve which, considered with the recording ammeter chart, shows the motor to be up to speed when the table begins to rise with any rapidity.

The Gary plant is filled with interesting automatic controllers. The completeness and effectiveness of the installation can be appreciated when it is considered that eight operators are able to turn out 100,000 lb. of rails per month. One of the most unique features of the plant is the automatic coal skips. Coal is delivered to the gas producer houses in standard railroad gondolas, from which it is dumped into a hopper. From here it goes through a crusher, and thence to the coal skips, which are of the double balanced type, and arranged to dump into the bins, from which the producers draw their supply. When at the bottom, the skip car automatically opens the chute gate and rests on one end of a counterweighted lever. If there is any coal coming through the crushers, it will feed into the skip; if not, the entire equipment will remain inoperative. As soon as a certain quantity of coal has been fed into the skip car it overcomes the counterbalance. This action starts the motor driving the hoist. In leaving the bottom position the chute is closed, and when the first skip car is dumped, a second is at the bottom and ready to take coal. This automatic action continues as long as there is coal to be hoisted, a counting device for registering the number of trips, being a fairly accurate indicator of the total tonnage of coal handled.

While this electrification of auxiliary apparatus has been going on, there has also been great progress made in the electrification of the rolls themselves. No electrical engineer is overoptimistic in believing that another 10 years will see the complete elimination of all motive power other than electricity in steel plants. In fact, the only question to-day seems to be whether auxiliary apparatus of a reversing character shall be operated by alternating current or by direct current. Experiments now being conducted at Gary, where both types will soon be installed, may lead to some definite conclusions on this subject.

A Connellsville Electric Mine Hoist.

There was recently installed in the mine of the Washington Coal & Coke Company at Dawson, Pa., a large mine hoist with an electric motor, which presents several features of considerable interest. The hoist is used to haul 35 mine cars, averaging 3800 lb. each when loaded, up a maximum grade of $8\frac{1}{2}$ per cent., 8000 ft. long, at a speed of 600 ft. per min. The loaded cars start at the bottom of the slope on a 4 per cent. grade, which gradually increases until the maximum grade of $8\frac{1}{2}$ per cent. is reached near the top, where the loaded cars are pulled in on a landing on a grade of about 6 per cent. and on a curve of 150 ft. radius. The empty cars are allowed to drift down the slope by gravity, controlled by a brake on the hoist drum.

The hoisting drum is 6 ft. diameter and 5 ft. wide between flanges. It is fitted with a hand brake on one end, and a hand operated friction clutch on the other end. The drum is of very heavy steel construction, with a 12-in. shaft. All the gears on the machine are cast steel with machine cut teeth, the main spur gear being

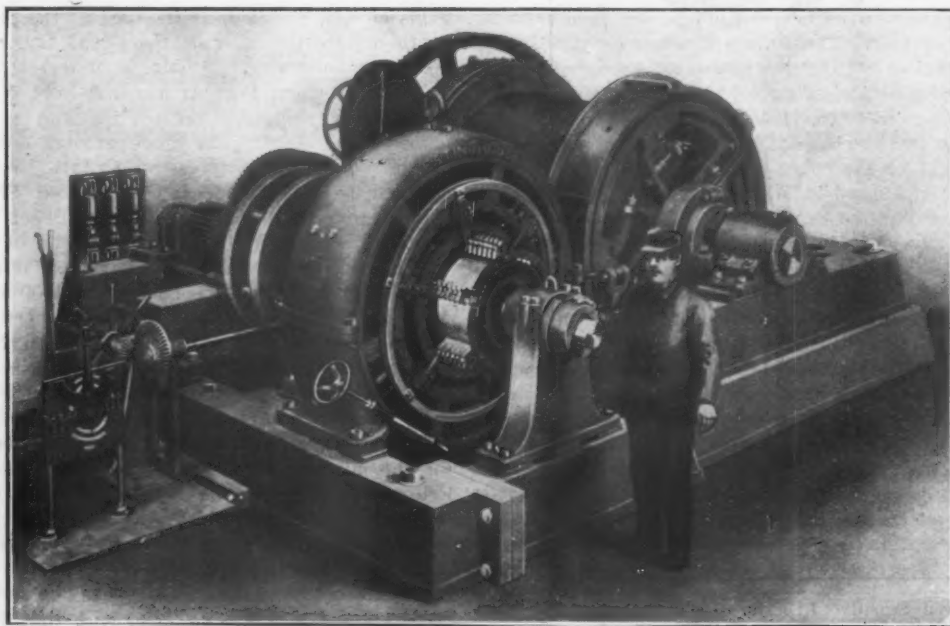
brought up to its full speed again. This is a particularly valuable feature in an installation of this kind where the cars may strike some obstruction, as it affords perfect protection to the apparatus.

When it is explained that this hoist is installed some 800 ft. below the surface of the ground, the advantages of the electric transmission of power are evident. In no other way could this large amount of power be transmitted as economically or as easily.

The hoist was supplied by the Connellsville Mfg. & Mine Supply Company, Connellsville, Pa.

A Westinghouse Gas Producer in a Double Role.

A Westinghouse bituminous gas producer for supplying fuel to gas engines, as well as furnishing gas for solder baths and enameling kilns, has been installed by the S. F. Bowser Mfg. Company, maker of oil storage and distributing tanks and automatic weighing pumps, in its modern factory at Fort Wayne, Ind. This type T producer plant, of 350 hp. capacity, supplies three 120-hp tandem horizontal engines, direct connected to di-



A Connellsville Mine Hoist Driven by a 500-Hp. Westinghouse Motor Installed for the Washington Coal & Coke Company at Dawson, Pa.

10-in. face and the motor gears 13-in. face. The frame is made in sections for convenience in installing in the mine. The drum and large gears and the friction clutch parts are also made in two pieces for the same purpose.

The hoist is driven through a flexible coupling by a 500-hp. direct-current non-reversing compound-wound Westinghouse motor. It is controlled by a standard semi-automatic Westinghouse magnetically-controlled unit switch controller. These switches are operated from the controller shown in the illustration, the controller carrying only small currents, while the main motor current is handled by the magnetically-operated switches, thus doing away with the difficulties from arcing. This controller has an accelerating relay which prevents the starting switches from closing too rapidly, and thereby prevents too large starting currents. Thus the second switch cannot close until the current allowed to flow by the closing of the circuit has fallen to a predetermined value. As soon as this value is reached the second switch closes, thereby short circuiting a resistance section, and the current rises, but the third switch cannot close until the current has again fallen to the predetermined value. This not only prevents injury to the motor from careless handling during acceleration, but also insures the most rapid starting possible. The controller also has a safety relay which opens the resistance switches in cases of excessive overload, and thereby protects the motor while running. If this relay operates while the motor is running the motor does not stop, but is automatically

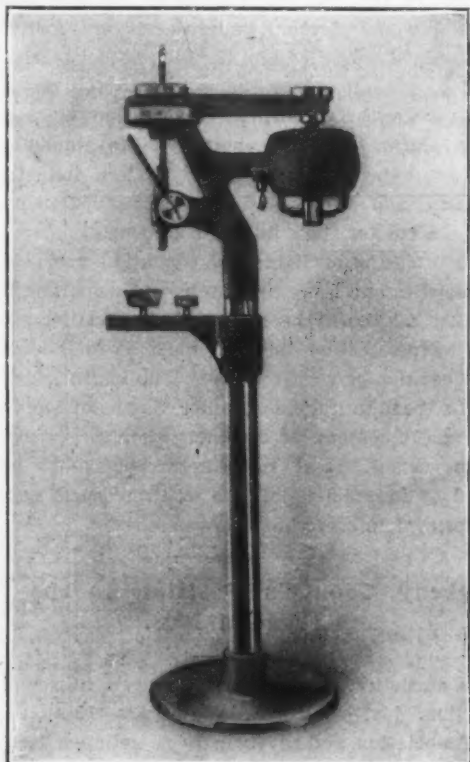
rect current generators. These furnish power to the shops, which are motor driven throughout. The equipment replaced by the present installation comprised three 150 hp. Scotch marine boilers, equipped with underfeed stokers, supplying steam to 50 hp. and 125 hp. simple engines. In the shops a large quantity of gasoline was formerly used for melting solder, while coke was required for the enameling kilns.

Recognizing the superior economy to be obtained from producer equipment, as well as the advantage of doing away with gasoline and coke in its own special case, the Bowser Company decided to install a complete new equipment for gas engines and gas producers. The matter of selecting a bituminous producer was carefully weighed, and members of the company visited a number of installations throughout the country to study the performance of the types in operation at the present time. The West Virginia coal, 13,000 B.t.u. per pound, used in the producer at present, is delivered at a cost of \$2.55 per ton. A Green County, Ind., coal, of approximately the same heat value, has been successfully experimented with, and will cost, delivered, \$2.25 per ton. The installation has been under the supervision of A. A. Bowser, brother of the president of the company.

Hyman A. Rosenthal, a member of the firm of Gordon & Rosenthal, Trenton, N. J., dealers in old material, having withdrawn, the business will now be conducted by Joseph Gordon in its entirety.

A Willey Motor Driven Sensitive Drill.

An improved form of the sensitive drill made by the Willey Machine Company, Jeffersonville, Ind., is shown in the illustration. It is built much heavier throughout than formerly, and has a square table instead of a round one, as previously used. The motor on this drill is connected to the spindle by a belt and cone pulleys, and three changes of speed are thereby provided. The motor is adjustably mounted for tightening the belt, making it unnecessary to shorten the belt to take up slack. The starting switch is within the motor frame, so that there are no connections outside of the motor. The table is counterbalanced by a weight inside of the column, and can be swung around out of the way when desired. The



A Motor Driven Sensitive Drill of New Design Made by the Willey Machine Company, Jeffersonville, Ind.

machine is described as one extremely simple and reliable, yet adapted to a wide range of work. The motors are interchangeable, and one can be easily detached and exchanged for another of different voltage or alternating current if desired. The following are the principal dimensions:

Drills to the center of.....	12 in.
Greatest distance spindle to table.....	38 in.
Traverse of spindle.....	3 in.
Diameter of table.....	11½ in.
Total height of drill.....	67 in.
Weight of machine.....	200 lb.
Maximum horsepower of motor.....	½

The machine is furnished complete with a motor either of direct or alternating current type and with a cup and V center, belt and chuck fitted ready for work.

Lake Shipbuilding Now Active.

The American Shipbuilding Company last week closed contracts with blast furnace interests for four large lake freight boats to be built before the opening of navigation next season. The four boats will cost about \$1,300,000. It is expected that two will be built in the Cleveland yard and the other two in Lorain. Three will each be 524 ft. long, and will have a capacity of 9000 gross tons. The fourth will be 545 ft. long and will have a capacity of 10,000 tons. This order makes five lake vessels that the American Shipbuilding Company received during the week, the other contract being for a passenger boat to be built for the Lake Erie Excursion

Company of Buffalo. The American Shipbuilding Company now has orders for nine lake boats for 1910 delivery. The list includes seven bulk freighters, two passenger steamers and a package freighter. Two of the large freighters are for the Pittsburgh Steamship Company.

The Great Lakes Engineering Works, Detroit, has taken contracts for four lake boats for 1910 delivery. Three of these will be built for the Northern Lakes Steamship Company, which was recently organized by Cleveland men. The fourth is a package freight boat, which will be built for the Mutual Transit Company, Buffalo.

The lake shipbuilders are now figuring on other inquiries and it is expected that several additional contracts will be closed during the month. The outlook in this industry is now far better than it has been at any time during the past two years.

A Thunder Bay Iron Ore Development.

TORONTO, September 4, 1909.—Activity in the iron fields of New Ontario, as the part of the province to the north and to the west of the Great Lakes is called, is becoming noticeable. Hundreds of men are at work in the country about Port Arthur and Fort William mining gold, silver, copper, iron pyrites and iron, the last-named mineral being in much greater quest than ever before. The new interest in Ontario iron ore is attributed to the change in the United States duty, a change considerably to the advantage of interests desirous of exporting Ontario ore to the United States. The Port Arthur *Chronicle* says that it is expected that in the next few months not less than 1000 men will be at work in the development of iron properties along the shores of Thunder Bay. The Dominion Bessemer Ore Company is working some of the deposits on the 6000 acres of ore lands it purchased some time ago in a locality about 22 miles from Port Arthur. The company recently gave a contract to McArthur Bros. of Chicago for the mining of 10,000 tons for furnaces in the Lake Erie region. F. W. Goodrich is in charge of operations for the McArthurs. The indications are that the company contemplates more or less permanent operations there. Mr. Valentine, who is directing the development, says that his tests appear to prove the existence of an ore body below the superficial one that is now being worked. In the opinion with which he is credited the property bids fair to become a large yielder of a fine hematite Bessemer ore, and to be a steady shipper for years. Work has so far been confined to a tract of about 25 acres. From this some 6000 tons has already been mined. As the deposit lies considerably above the level of Lake Superior the loaded cars are moved by gravitation. There are two stock piles, one of ore whose iron content is about 40 per cent., the other of ore approximating 60 per cent. An ore dock is to be built in time for the shipping this fall of the 10,000 tons above mentioned as destined for Lake Erie ports.

Five thousand acres of the company's mining land is held in fee simple and not upon lease or mining privilege. It is made up of what were formerly 18 locations, running from 160 to 200 acres. The property passed successively into the hands of the Minnesota Mining Company, Mr. Barker of Buffalo, the Kalderhauser & Houghton Company and the Dominion Bessemer Ore Company. Up to the present either doubts as to its contents or lack of a market prevented any large application of capital to the work of developing it. The present owners seem to feel that they have warrant for making liberal expenditure upon it, both because it appears to have an abundance of good ore that can be cheaply mined, and because there is a demand for the ore.

C. A. C. J.

The Niles Forge & Mfg. Company, Niles, Ohio, which is building a new plant, expects to have it ready for operation late this month. The company will make heavy forgings.

THE IRON AGE

Established in 1855.

New York, Thursday, September 9, 1909.

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						HANDWRITER EDITOR.

Industrial Training in Small Towns.

The substitution of a local machine shop or factory for the shoprooms of the trade school suggests interesting possibilities in small communities where it is out of the question to establish completely equipped institutions of that character. Most towns which owe their existence to local manufacturing industries are large enough to have good schools; but the population being too small to afford the expense of equipping and maintaining an industrial school, the boy must go elsewhere if he is to receive the advantages of a practical education. It is held, however, that the co-operation of local industries with the public schools offers an excellent method of meeting the neighborhood requirements in this respect. The recent establishment of such a relationship at Beverly, Mass., affords a basis upon which to consider the subject. The United Shoe Machinery Company has equipped a model shop in its works in that small city, where the boys of the local industrial school will receive the shop end of their education. Two divisions of the school will alternate between the schoolroom and the shop. The necessary instruction in the so-called theoretical subjects will be directed by the school teachers, while specialized instructors will direct the training of the shop. The Fitchburg idea is somewhat similar, in placing the shop training of the students in the works of local industries, but under the supervision of a man with a broad experience in this branch of pedagogy. The United Shoe Machinery Company will lead the training along the lines of its own industry. Doubtless a large proportion of pupils will come from the families of employees of the works, which are extensive. The boys as a finished product of the school will have been specialized in this one branch of manufacturing, but at the same time they will be grounded in the essential principles of all industries which manufacture in metal.

There are many towns which are either built about a great manufacturing plant or have a few large works constituting the chief source of income to the inhabitants. Certain places have some characteristic industry, with a number of concerns manufacturing competing or similar lines, all having sprung directly or indirectly from some common source. With them, as with every other manufacturing enterprise requiring skilled labor, the dearth of available men is becoming a more serious problem with the return of each succeeding prosperous period. Few fail to realize that aggressive measures are necessary to promote the practical education of boys if the standard of the American workman is to be maintained.

Let us suppose that a town of 5000 people is mainly supported by a single class of metal manufacture. A local industrial school is too expensive to have one, but there is a high school. Even without the employment of an expert in industrial training a very good work could be done if the manufacturers would co-operate with the high school. This can be done by taking the boys who would like an industrial training, affording them the opportunity for the shop end of the work, the remainder of which would be attended to in the high school, a definite co-relation being established. In the beginning the course might be crude, judged from the standards of scientifically worked out industrial education. But, nevertheless, it would serve a useful and important purpose and would develop under intelligent fostering by the owners of works and by the high school teachers who should be able to adapt themselves to the task. Boys would receive the rudimentary knowledge which as they become skilled workmen would be invaluable. They would be under the influence of modern industrial environment, and they would be less inclined to seek the larger centers for their initial employment.

The problems of industrial education are being met and solved in one large community after another, but the beginning has hardly been made in the smaller manufacturing towns. Either the boys must go to the cities for their education or go without it. The migration of thousands of them, as they seek other classes of employment in the great centers, is constantly going on. To check this movement, local manufacturers should interest themselves in the possibilities of some such system as here outlined in their home towns.

Allegheny County's Position in the Steel Trade of 1908.

The statistics of Allegheny County's iron and steel production, just published by the American Iron and Steel Association and given in these columns last week, are to be interpreted in the light of the price maintenance policy pursued by the various steel companies last year. It is evident that some unusual condition must have prevailed in the steel trade to cause the Pittsburgh District to fall below its normal percentage of the country's steel business. In the depression following 1893 the Pittsburgh District increased materially the percentage of the output of steel ingots and various finished rolled forms which it contributed in prosperous times. The policy of "any price to get the order" was in vogue then and Pittsburgh was its chief exponent. The result of the co-operative price policy of last year is seen in the falling away of Allegheny County's percentage of finished rolled iron and steel from 28.3 in 1907 to 24.1 in 1908. What is perhaps more surprising is that Allegheny County's percentage of the Pennsylvania total of rolled iron and steel should have declined from 55.9 in 1907 to 50.9 in 1908. Plainly eastern Pennsylvania fared better relatively than in any preceding time of stress.

One feature of the statistics is not entirely clear, however. Allegheny County produced 24.5 per cent. of the pig iron of the country in 1908, against 21.1 per cent. in 1907, and 56 per cent. of the pig iron of Pennsylvania against 47.9 per cent. in 1907. In open hearth steel a similar showing was made—an increase from 33.6 per cent. in 1907 to 39.6 per cent. of the country's total, and from 49.3 per cent. in 1907 to 58.3 per cent. of Pennsylvania's total. That stocks of pig iron increased last year may account for the contrary showings in pig iron and finished material, but steel ingots and billets are not

manufactured to any extent to be carried in stock, and if the open hearth ingots were produced in Allegheny County in 1908 in greater proportion of the country's as well as Pennsylvania's total than in 1907, a like increase might be expected in structural shapes, plates and bars, instead of a decrease as the statistics show. The shipment of sheet bars from Pittsburgh to Ohio plants of the Steel Corporation must have been much beyond the ordinary to account for the seeming discrepancy.

But the real significance of the figures lies in the fact that in a time of depression, when low costs count, Pittsburgh fell away from the pre-eminence usually attributed to it, and that, too, with Gary not yet in position to operate. In the light of events in the iron trade since February, 1909, it may be predicted that Pittsburgh is not soon likely to repeat the performance of 1908, at least to the extent of producing a smaller share of the Pennsylvania total in a year of adversity than under conditions of general prosperity.

System Necessary to Reduce Accident Costs.

In many works insufficient attention is given to eliminating elements of danger of accident to employees. Inspection of equipment with this end in view is often desultory. A serious accident may be followed by vigilance, but this gradually subsides as the incident is forgotten and is renewed only when the next man is injured. There is no system about it. Responsibility for this very important factor of management is not fixed. Regarded both in its influence on costs and from the standpoint of the paternalism which the employer usually feels toward his employees, the matter is most serious. While insurance against liability for accident is now quite generally carried, still where the individual causes unusual expense to the underwriters premiums are apt to be raised sooner or later. Then again accidents have a tendency to disorganize a working force, which affects production. The welfare of workmen is regarded as an essential element in successful management, in keeping down the disturbing influences of discontent. It usually happens that when men are injured, even though it be through their own carelessness, the owners are regarded by the body of employees as indifferent to everything but the money they can gain through the labors of their people, unless the victims are given a substantial recompense for their injuries. That careful inspection and subsequent intelligent and immediate action to remedy weaknesses of this character in the works will pay handsomely in the course of time is a well established fact.

The American Steel & Wire Company has one of the best developed of the systems for guarding against accident. It has been in operation for some time, with such excellent results that never in the history of the company, nor of those companies which it succeeded in ownership of its various works, has such keenness been shown in applying preventives. Guards and stops and danger signals and any other device which may be found to make the operation of the plants safer for the employees are immediately adopted when a danger point is found. The company has an accident department, with a manager and a central office. Each works has a committee made up of engineers and foremen. At periodic intervals the plants are inspected, and a report with recommendations is made for each and submitted to the manager of the district. These reports finally converge in the general superintendent's office, and he authorizes the adoption of the feasible and attractive features. At

the same time the manager of the accident department is kept fully informed, and his suggestions are also given careful consideration. The system appears complete. Responsibility is fixed, and the effects have been strikingly important.

The average intelligence of workmen in American factories is not up to the standard of the past. The cost of production has been lowered and the quality of the product has generally been improved, but this is not due to the high character of the new labor which has been brought from abroad to meet the increasing demand for men. Many of the workmen who have recently come from Europe are ignorant of everything in a manufacturing plant, except the one task to which they have been put. A considerable percentage of them have slight knowledge of the English tongue. To render their occupation safe they must be hedged in by safety devices. Usually, the accidents which they suffer are due to their own carelessness or lack of experience in a factory. Deliberate, intentional subjection to danger in the expectation of damages is by no means unknown. Therefore the employer can afford to take no chances. He must remove every menacing condition of equipment and environment, if he would keep down the expense of accidents to as low a point as intelligent safeguard can bring it.

There is no better way to accomplish the reform than by a rigid system of inspection. The superintendent should make his foremen responsible and hold them to strict account. A report in regular form, preferably on printed blank for filing, should be made of every case where an opportunity for improvement has been found. Machinery and all other equipment should be examined with closest scrutiny for elements of danger. Shafting and other moving bodies should be inspected regularly. Where electrical apparatus carries dangerous currents it should be guarded against the approach of the careless or ignorant. The relative positions of machines should be taken into account, that one may not be a source of danger to the operator of another. The personal element of working forces should be studied, so that wherever possible a lack of intelligence may be separated from likelihood of accident. The superintendent himself, with the works engineers, would do well to follow the example of the American Steel & Wire Company, and at intervals make detailed inspections. It is a factor of works management the importance of which it is much better to exaggerate than to shirk.

A New Record in Steel Making Pig Iron.

August has signalized the advance of the iron trade toward prosperity by making a new record of pig iron production so far as the steel companies are concerned. In October, 1907, just before production made its panic plunge downward, the output of steel making pig iron by the steel companies themselves was 1,514,521 gross tons. Last month it was 1,591,991 tons. The comparison brings out strikingly the fact that on its steel side the iron trade has overtaken and even passed the record month in the record year. It will be remembered that October, 1907, was a month of unusually heavy shipments from steel rolling mills. There was a feeling in some quarters that if a check came to the pace then prevailing the mills might secure themselves in advance against cancellations by shipping to the limit of specifications in October. It did not occur to some who reckoned thus that within a few weeks they would be as anxious to withhold shipments, under the widespread uncertainty

about credits, as they had been in October to make them.

So remarkable a record as has been made by the steel mills in the closing weeks of this remarkable summer in the iron trade emphasizes the fact that in foundry lines there has not been a like recovery of lost ground. As was the case in 1905 the foundries are lagging, and this condition may be expected for some time. All the wreckage of the financial storm of 1907 has not been cleared away, and some time must yet elapse before we may look for such an outflow of capital into new enterprises as will furnish the basis for widespread prosperity in the foundry trade. The total pig iron production of August is not yet up to the record month, though at 2,246,000 tons it is measurably in advance of the average of 2,206,000 tons a month in the first half of 1907, when our greatest six months' output of pig iron was made. The foundry iron furnaces can travel only as fast as the foundries will let them.

CORRESPONDENCE.

Specifications for Light Steel Rails.

To the Editor: While I thoroughly agree with the writer of the article in *The Iron Age* of August 19 relative to the need of specifications for light steel rails, I think that possibly an elaboration of the subject would not be amiss at this time. Many have been the difficulties which I and others making rerolled light rails have had to overcome as pioneers in this particular line. Our product was ridiculed by manufacturers rolling light rails from billets or other new steel, and when this did not avail we were constantly harassed by fluctuations in the price of both our finished product and raw material, which were manipulated by our competitors. It was not until the manufacturers using the rerolling process turned the tables by initiating the price manipulation that our competitors were made to see the error of their ways.

To-day the question of quality as compared with rails rolled from billets does not enter into the matter of sales, as it is recognized that for practically all purposes a rerolled rail is equally as good as a rail rolled from billets, assuming, of course, that the product is carefully selected, both as to raw material entering into it and the finished rail when taken from the hot bed. The only question that might be raised is that the lengths are not uniform, but are sold as mill lengths. As our experience has taught that the requisition for uniform lengths of light section rails is not material, this is not a factor.

I have sometimes heard that a rerolled rail is more brittle than rails rolled from billets. This is true only to the extent that a rail rolled from 45 carbon steel is more brittle than a rail rolled from a 12 carbon steel, but, as explained in the article of August 19, there is no manufacturer of light steel rails rolled from billets who uses a uniform carbon, as these rails are invariably rolled from odds and ends of billets running from 8 to 80 carbon, they being either the crop ends of ingots or surplus billets from heats of special carbons. Occasionally rails rolled by either process is apt to be brittle when the rail is rolled at an improper heat, or when some slight delay occurs on the mill or in its passage through the rolls the rail may become chilled by too much water. These are, of course, difficulties that are easily controlled and are due to carelessness when they occur.

Every argument that might be used in disparagement of the quality of a rail rolled from old rails has been advanced by representatives of mills who are not using this process. As an instance of how their operations have availed, I am pleased to say that only recently, after a representative of a steel company left its service, he advised me that among other lines he was going to take up, he proposed to sell light rails, rolled from old rails; he asserted that he was familiar with all the argu-

ments that might be used against them, but desired information from me wherewith to refute these attacks and further, to be able to prove that a rerolled rail was not only equally as good, but superior. While I do not know who the correspondent is that signs himself "Quality," yet from his definite knowledge of conditions and methods used by mills rolling rails from so-called billets, it occurs to me that he might be identical or closely connected with the gentleman referred to above.

The fact that so many products are made from old rails, such as structural tubing, agricultural shapes, concrete reinforcing bars, cotton ties and even wire rods, would in itself indicate that the quality of such raw material is of the best. The question of the quality of the finished product is, of course, a matter which depends largely on the individual manufacturer and the care exercised in the operation.

A. F. BAUMGARTEN,

PITTSBURGH, September 1, 1909.

A Patent Specification Library Given to the Electrical Engineers.

The Western Electric Company, Chicago, has presented to the library of the American Institute of Electrical Engineers, 33 West Thirty-ninth street, New York, a most valuable addition in the shape of a patent specification library. This gift constitutes the largest accession since the original creation of the library by Dr. S. S. Wheeler with the Latimer-Clark collection. The patent library which the institute thus acquires contains 461 substantial leather bound volumes containing approximately 100,000 specifications. These specifications begin with May 30, 1871, and run to December, 1908, thus covering the entire period of activity, which includes the telephone, the electric light, electric railroads and the electric motor. From May 30, 1871, up to the last day of 1887 the volumes are complete, containing all the specifications issued by the Patent Department, certified. From July, 1887, up to December 1, 1908, the volumes contain all the electrical specifications which are not certified.

The original set cost over \$4000, and duplicates of these specifications, if now purchased from the Government and bound, would cost between \$4000 and \$4500. It is generally believed that it will prove one of the most valuable accessions that the institute library could possibly have from the standpoint of practical utility, and that it will be likely to stimulate further generosity of the same kind. It is a most fortunate coincidence that the institute had already been presented with a set of specifications antedating the period prior to those included in this gift.

The St. Louis Centennial.

St. Louis is making extensive preparations to devote the week of October 3-9 to the celebration of the centennial of its incorporation. The scope of the celebration is not local, nor is it limited to section. It will draw visitors from all parts of the United States. Through publicity methods, direct and personal, the Centennial Association will draw to St. Louis, from every part of the Union, former residents of the city and descendants of such residents. Manufacturers of St. Louis will vie with each other to produce the most spectacular and impressive parade ever witnessed in the West. Every prominent organization of the city, in addition to its participation in the general programme, is planning features of its own, to emphasize the 100 years of progress since the incorporation of St. Louis.

Centennial week will be the occasion of many notable gatherings in St. Louis, including a national convention of retail merchants for an exchange of ideas on salesmanship, advertising, window displays, store arrangements and other matters of vital interest to all retailers. The St. Louis Centennial Association has obtained reduced railroad rates for centennial week from practically all parts of the United States including the Pacific Coast.

Heavy Iron Ore Imports to the United States in 1910.

Important Contracts Already Made Which, With Cuban Shipments, May Yield a Total of 2,500,000 Tons.

The iron ore situation as it affects the blast furnaces of eastern Pennsylvania and New Jersey has attracted much attention in recent weeks. Some of the developments are no doubt the result of the rapid advance the iron trade has made toward prosperity in the summer months. Others, as will be referred to later, are due to a gradual change in the status of Eastern merchant furnaces.

What is of immediate interest is the probability that the imports of iron ore to the United States in 1910 will be not far short of 2,500,000 tons. Sales already made amount to about 700,000 tons. Other negotiations are expected to bring this total up to 1,100,000 tons, while the shipments of the Maryland, Pennsylvania and Bethlehem steel companies, according to present calculations, will not be less than 1,300,000 or 1,400,000 tons. At Philadelphia new unloading machinery is being provided for the Port Richmond docks, and it is evident that even so the receiving facilities will be strained to the utmost, as it is expected that an average of one iron ore cargo a day must be unloaded there in the coming year. The shipments to merchant furnaces of the Lehigh and Schuylkill valleys will be made through Philadelphia, as will the bulk of the Bethlehem Steel Company's ore. The Cuban ores of the Maryland Steel Company are unloaded directly into the Sparrows Point yard, while those of the Pennsylvania Steel Company pass through Baltimore.

The Competitive Status Changed.

Since the Hill ore deal and the general dissemination of the idea that lake ores are worth \$1 a ton in the ground, the cost of his raw materials has been a matter of serious thought to the Eastern blast furnaceman. Lake Superior ore prices and freights from Lake Erie to eastern Pennsylvania have been at such levels as to make pig iron production in that section only fairly remunerative in good times and a grave problem when prices fell and demand shrank. Coke freights have added to the embarrassment of such furnaces. On Connellsville coke the rate to Lehigh and Schuylkill furnaces, which was \$1.95 three years ago, has advanced to \$2.05. At the same time Buffalo furnaces, whose competition the Eastern furnaces have felt increasingly in their foundry iron trade, have been able to secure a marked reduction in their coke rate from the Connellsville District, or from \$2.05 to \$1.65. Buffalo furnaces, moreover, are independent of the ore market, having their own Lake Superior mines. There has been also the competition of modern New Jersey furnaces having their own ores. Altogether, therefore, the eastern Pennsylvania pig iron producers have been put to it to find means of reducing their cost. In two instances the dry blast has been resorted to and with good results.

However, with the crowding in of pig iron from modern blast furnaces in districts having lower costs, the tenure of some of the older Eastern stacks would have been made precarious indeed had it not been for the important increase in basic open hearth steel manufacture in the East in the past four or five years. Furnaces previously dependent on the foundry trade have found in this expansion of the Eastern steel industry a new lease of life.

Lake Ores Versus Foreign Ores.

As was predicted when the sale of the Hill ores was put through, the enhancement of lake ore values, in part because of their increasing engrossment by the large companies, has stimulated the search for new supplies. New York concentrates have been in greater demand, and the drawbacks attending importations have not been counted so serious. What has helped the Cleveland ore firms to hold their trade in eastern Pennsylvania is the practical certainty that ores bought will be delivered. Ores from Lake Erie docks can be had the year round.

Then, having had certain lake ores in their mixtures for years, furnacemen were loath to change. The fluctuations in ocean freights were a factor, often an important one, where Mediterranean ores were bought. True, the ores were sold f.o.b. cars at Atlantic port, but where freights advanced, say, \$1 to \$1.50 over the basis of 6 to 8 shillings on which sales of European ores are based, there were possibilities of heavy losses to sellers, and the delays in shipments, where furnaces had no large storage space, were sometimes embarrassing. One case of some years back is recalled in which freights advanced sharply and a contract a steel company had made to bring in foreign ores was canceled by consent, to save the seller from financial disaster.

The recent large sales of foreign ores to come in next year may be thought to be in part a result of the 25 cents reduction in the ore duty. That had little to do with the matter, though 50 cents reduction on the ore required for a ton of pig iron certainly reinforced other considerations. As an example: Wabana ore from the well-known Belle Island deposits of Newfoundland has been coming into the United States for 10 years, the shipments for a year ranging from 5000 to 280,000 tons, with a total of about 1,000,000 tons, including this year's shipments. The 40-cent duty did not prevent these imports, but since the 15-cent tariff went into effect the buyers have received a rebate equal to the reduction. What has been turning Eastern furnacemen toward foreign ores is the fact that while lake ores sufficient for a ton of pig iron (or about 2 tons) cost about \$10, delivered at furnace, equivalent imported ores can be had at \$8 to \$8.50.

Important Sales of Newfoundland, Spanish and Swedish Ores.

The sales already made for next year include 250,000 tons of Wabana ore and 400,000 tons of Mediterranean ores, chiefly from Spain. The sales of Wabana were at 7 cents a unit, f.o.b. Philadelphia, that being also the price for 1908 and 1909. In addition to the ores mined on Belle Island the mining company, the Nova Scotia Steel & Coal Company, has, as has been published, extensive submarine ore bodies, which are reached by a tunnel through the Dominion Iron & Steel Company's mines, also submarine. Each of these companies is estimated to have about 100,000,000 tons of ore under the sea. The Wabana ore, which is sold for basic and foundry iron mixtures, is a red hematite and as crushed is in excellent condition for furnace use. Its analysis shows 52 to 53 per cent. metallic iron; moisture, 2 to 2.5; manganese, 0.202; phosphorus, 0.80 to 0.90; sulphur, 0.045; silica, 7.50 to 8.50; alumina, 3 to 3.50; lime, 2.47; magnesia, 0.576. It is sold by Pilling & Crane, Philadelphia.

The Mediterranean ores sold for 1910 delivery, largely negotiated through the Philadelphia office of an important Spanish firm, are of varying classes and the prices paid f.o.b. Philadelphia range from 7½ cents a unit for the lower grades to 9¼ cents for high grade low phosphorus qualities. The bulk of these ores show iron in the dry of about 54 to 56 per cent.; silica, 5 to 6 per cent.; phosphorus, 0.04 per cent. Sulphur is low. The other sales were of smaller quantities, the ores coming from various Mediterranean districts and from northern Spain. Earlier shipments of some of the Spanish ores sold for next year showed a larger percentage of fines than those now coming over, screening at the mines having been resorted to. From 70 to 80 per cent. of these ores now brought to the United States passes over a ½-in. screen.

Swedish ores, chiefly for furnaces in the Schuylkill Valley, are now coming to this country in considerable quantities. As the result of the visit to the United States made last year by a representative of the Kirun-

avara mines in the north of Sweden, contracts were made for 1909 delivery, and it is estimated that 200,000 tons will have been shipped through Philadelphia this season and the coming winter. Larger shipments of these ores are expected in 1910, though contracts have not been closed as yet. The Kirunavara ore is a hard magnetite which is crushed before shipment. It contains from 60 to 70 per cent. metallic iron, while phosphorus runs from 0.05 to 3 per cent. The average ore mined carries from 0.75 to 1.50 per cent. phosphorus, the higher phosphorus ores being shipped to Germany for basic Bessemer practice. It might be judged that Germany, Belgium and Great Britain would take all the Swedish ores that could be shipped under the government restrictions upon the output; but the provision of an additional outlet on the Eastern seaboard of the United States has apparently been considered of value as strengthening the European market. Shipments of Kirunavara ore are made through the port of Narvik in Norway. The docks there were described in *The Iron Age* of January 9, 1908, page 127.

Iron Ore Imports in Recent Years.

That the importation of iron ore to the United States next year will much more than double the average imports of recent years is evident from the record of shipments as given below, together with the sources of the ore:

Imports of Iron Ore to the United States.—Gross Tons.

	1904.	1905.	1906.	1907.	1908.	First half 1909.
Cuba	364,630	539,935	639,362	657,133	579,668	358,042
Newfoundland and Labrador.....	5,400	5,600	125,395	89,685	53,298	49,646
Canada	77,887	104,096	57,890	26,878		
Greece	2,500		48,630	23,800		
Sweden			9,278			
French Africa.....				65,940	*143,932	†164,843
Spain	36,810	191,861	171,870	296,318		
All other.....	386	4,159	7,965	69,414		
Totals.....	487,613	845,651	1,060,390	1,229,168	776,898	572,531

* Europe, 143,922; other countries, 10. † Europe, 159,482; other countries, 5,361.

Of the shipments from British North America in 1908 and the first half of 1909, as indicated above, practically all came from Newfoundland.

So far as the merchant furnaces of the Lehigh and Schuylkill valleys are concerned, 2,500,000 tons of ore would be ample for an output of pig iron equal to that of the record year 1907. When Adirondack concentrates and local ores are added to the importations already arranged for for 1910, it would appear that the amount of Lake Superior ore required in those districts next year will be an almost negligible quantity.

The Atlas Car & Mfg. Company's Orders.—The demand for industrial cars and locomotives shows great improvement, according to reports received from the Atlas Car & Mfg. Company, Cleveland, Ohio. This company is now running its plant at full capacity. Among the orders recently received are the following: Two 50-ton double truck locomotives, with four 65-hp. motors on each locomotive, for a Western smelter; two storage battery locomotives, one 10-ton and one 15-ton, for a large manufacturing concern in the East; 30 40-ton special dump cars for handling ore for a steel plant. This company is shipping to Canada two 50-ton cars, operated with compressed air, for use in a limestone quarry, and has under contract a number of small industrial railroads which are now under way.

Car and Locomotive Building.—In addition to the 2000 cars recently reported as ordered by the Rock Island road, 1550 have been placed by that system. The St. Louis & San Francisco ordered 900 additional from the American Car & Foundry Company and 1000 from the Standard Steel Car Company. The St. Paul will build 1500 cars at its own shops. Miscellaneous orders and inquiries reported by the *Railroad Gazette* total 400 cars, passenger and freight. The St. Louis & San Francisco has ordered 20 locomotives and the New York Central is in the market for 235.

Judge Gary in England.

The *Sheffield Daily Telegraph* of August 26 prints an interview with Judge Elbert H. Gary, chairman of the United States Steel Corporation. Naturally, the English public is interested in knowing how Judge Gary succeeded so well in inducing the American steel manufacturers to co-operate in maintaining prices after the 1907 panic. The interviewer brought this question to the front. Following are extracts from the report of the interview:

"How did you overcome the natural jealousies which were bound to arise between various firms?"

"Probably some one else could talk about that better than I can, because I took a prominent part in it. It was done entirely by a friendly, but positive effort on the part of those in charge to distribute the business voluntarily on a basis that was perfectly fair and just between all concerned, dependent on their capacity to produce. Practically and more definitely at the first meeting, I suggested that a committee of seven be appointed by the 60 or so representatives of the different firms, which committee might be appealed to at any time for information and advice.

"I was made chairman of that committee, and during the following year, whenever any of the manufacturers had reason to think they were being unfairly treated by

any of their competitors, they would come to me with their complaints. I would request the company complained of to send their representatives to my office, and we would talk it over and undertake to satisfy them they were making a mistake. The result was that without exception the difficulties were straightened out, and as a general rule the business was conducted on a basis perfectly fair to all concerned.

"As to the maintenance of prices, well, we did not make any agreements, and could not make any agreements, under the law of our country. We could, in the first place, fully inform one another of exactly what we were doing, as we agreed to do, and we agreed that if any of us decided to change our prices at any time we would notify all the others. The effect was that no prices were changed, and no effort was made on the part of any of the manufacturers to get business which legitimately and naturally belonged to other companies. Because why? It was exposed immediately. Whenever a lot of men engaged in a competitive business come together frequently and put on the table all the facts with regard to each one's business, so that all may know what is being done, the result is that nothing unfair is done, because of a feeling on the part of all the others that some one man is not acting fairly with regard to his neighbor. In other words, we had absolute publicity of the business affairs of each one engaged in the competitive business, so that all could know, all the time, exactly what each other was doing.

"It was entirely novel. No such scheme had ever been tried before, and it was pronounced at the outset by those in the business to be absolutely impracticable, but it turned out in practice to be not only practicable but exceedingly satisfactory."

"So that you practically pooled the iron and steel business of the country?"

"That is what it amounted to, although we do not call it that in our country. It would not be allowed in America, as being contrary to the law. The whole proceedings of the arrangement were entirely public and above board. After every conference I had the represen-

tatives of the press there, and gave a complete statement of all that had been done, so that the whole of the proceedings were done in the light of day."

Briefly, we touched on the tariff question, on which the Judge has decided views:

"I would not object to free trade, if all countries had free trade. It is not fair that there should be protection of an industry in one country and no protection of the same industry in another country. It places the unprotected industry at a disadvantage. I believe in reciprocal relations between all the countries of the world."

Discussing trade prospects, Judge Gary said he thought the conditions in this country were more or less connected with, and dependent on, the conditions in America:

"When we have depression in America it is not long before it is felt in England. So when times begin to improve in America, they begin to improve over here soon after. In America during the last few months there has been a decided improvement in trade conditions, particularly in iron and steel, which is the barometer of trade generally. That being so, England will soon begin to feel the effects of that improvement also."

The Marking of Imported Cutlery and Other Articles.

WASHINGTON, D. C., September 7, 1909.—The Treasury Department has prepared a series of regulations for the marking of imported cutlery and other articles which under the terms of the new tariff act must be so stamped, branded, or labeled, as to indicate the country of origin, name of maker or purchaser, &c. The regulations are in part as follows:

General Regulations.

Section 7 of the tariff act of August 5, 1909, provides as follows:

That all articles of foreign manufacture or production, which are capable of being marked, stamped, branded or labeled without injury shall be marked, stamped, branded or labeled in legible English words, in a conspicuous place that shall not be covered or obscured by any subsequent attachments or arrangements, so as to indicate the country of origin. Said marking, stamping, branding or labeling shall be as nearly indelible and permanent as the nature of the article will permit.

All packages containing imported articles shall be marked, stamped, branded or labeled so as to indicate legibly and plainly in English words the country of origin and the quantity of their contents, and until marked in accordance with the directions prescribed in this section no articles or packages shall be delivered to the importer.

Should any article or package of imported merchandise be marked, stamped, branded or labeled so as not accurately to indicate the quantity, number or measurement actually contained in such articles or package, no delivery of the same shall be made to the importer until the mark, stamp, brand or label, as the case may be, shall be changed so as to conform to the facts of the case.

The Secretary of the Treasury shall prescribe the necessary rules and regulations to carry out the foregoing provision.

Said section relates to the marking of all imported merchandise capable of being marked, except cutlery, watch and clock dials, and watch and clock movements and cases, which are specifically provided for by paragraphs 152, 154 and 192 of said act, as follows:

Paragraph 152 provides that all pen knives, pocket knives, clasp knives, pruning knives, budding knives, erasers, manicure knives and all other knives by whatever name known, which have folding or other than fixed blades or attachments, finished or unfinished, razors, finished or unfinished, and razor blades, scissors and shears, and blades for the same, finished or unfinished, shall, when imported on and after October 1, 1909, have the name of the maker or purchaser, and, beneath the same, the name of the country of origin, die sunk, conspicuously and indelibly on the shank or tang of at least one, and if practicable, each and every blade thereof.

Paragraph 154 provides that table, butchers', carving, cooks', hunting, kitchen, bread, butter, vegetable, fruit, cheese, carpenters' bench, carriers' drawing, farriers' fleshing, hay, tanners', plumbers' painters', palette, artists', and shoe knives, forks and steels, finished or unfinished, shall when imported on and after October 1, 1909, have the name of the maker or purchaser, and beneath the same the name of the country of origin indelibly stamped or printed thereon in a place that shall not be covered thereafter.

Paragraph 192 of said act provides that all watch and clock dials, whether attached to movements or not, shall have indelibly painted or printed thereon the name of the country of origin and that all watch movements, lever clock movements with jewels in the escapement, and cases of foreign manufacture shall have the name of the manufacturer and country of manufacture cut, engraved or die sunk conspicuously and indelibly on the plate of the movement and the inside of the case, respectively, and that the movement shall also have marked thereon by one of the methods indicated, the number of jewels and adjustments expressed both in words and in Arabic numerals.

Penalties for Fraudulent Marking.

Section 8 of said act provides as follows:

If any person shall fraudulently violate any of the provisions of this act relating to the marking, stamping, branding or labeling of any imported articles or packages, or shall fraudulently deface, destroy, remove, alter, or obliterate any such marks, stamps, brands, or labels with intent to conceal the information given by or contained in such marks, stamps, brands, or labels, he shall upon conviction be fined in any sum not exceeding \$5000, or be imprisoned for any time not exceeding one year, or both.

Appraising officers will make a careful examination of all merchandise in their hands for appraisement, in order to determine whether the same is marked in accordance with said provisions of law, and if they find the same not so marked they will so report to the collector, and the merchandise will be sent to the general order stores and treated as unclaimed, and not delivered therefrom, unless for exportation, upon due entry for that purpose being made, until properly marked by the importers under the supervision of the collector.

The word "purchaser," as used in said paragraphs 152 and 154, is held to refer either to the purchaser shown upon the consular invoice or to the ultimate consignee as shown in the declaration made upon entry. In the case of cutlery shipped to this country for sale upon consignment, as there is no purchase, the same must be marked with the name of the manufacturer.

Articles usually imported in bulk, when secured together for convenience in handling, are not considered such packages as are required to be marked.

Merchandise entered for immediate transportation or in transit through the United States to a foreign country is not required to be marked under said provisions of law.

Articles 312 to 314, inclusive, of the Customs Regulations of 1908 are amended accordingly. W. L. C.

The Wilkes Rolling Mill Company to Manufacture Iron Tin Plate.

The Wilkes Rolling Mill Company, established 18 years ago at Sharon, Pa., is making improvements to its plant, so that, in addition to muck bar and iron sheets, it will hereafter produce tin plate made from all pig iron muck bar. The new department is nearing completion and will be ready for operation about September 30. When the improvements are completed the company's plant will consist of the following: Bar mill building, about 40 x 185 ft., containing an 18-in. bar mill, five double puddling furnaces, squeezer, &c.; sheet mill building, about 110 x 160 ft., containing one hot and one cold mill, annealing furnace, one bar and two tin furnaces, pickling tanks, cutting and corrugating machinery, a 15-ton Cleveland electric traveling crane, &c.; tin department, occupying a new building, set on concrete piers, with iron roof and siding, about 45 x 80 ft., containing one Morewood tinning pot and other necessary appliances. A new Russell doubling shear and a 48-in. squaring shear are to be installed in the sheet mill. The boiler equipment consists of eight Wheeler water tube boilers, aggregating 1300 hp.

The Wilkes Rolling Mill Company has sufficient land on which it can erect additional buildings as required. Its output will hereafter be muck bar, pure double refined iron sheets and iron tin plate. Its sheet capacity averages about 15 tons daily and the new tin department, when completed, will produce about 10 tons daily. The shipping facilities are excellent. The company is composed of practical workmen, who have grown up in the business.

A report given publicity in the daily press that the Allis-Chalmers Company, Milwaukee, Wis., is preparing plans for a foundry building, duplicating the present capacity of the company, is declared by an official of that company to be without foundation. Business, however, is reported to be steadily increasing, and it is stated that without question the entire works will within a short period be rushed to their full capacity.

Movement of iron ore this season across the docks at Escanaba, Mich., has so far broken all the records, that the railroad companies interested are planning an increase in loading facilities which will involve the ultimate outlay of about \$1,200,000.

NEWS OF THE WORKS.

Iron and Steel.

The Pulaski Iron Company, Pulaski City, Va., expects to blow out its blast furnace in the latter part of September.

The Maryland Steel Company blew in its A furnace August 2. It had been out of blast for six months. The fourth furnace may be put in later in the year, when one of the two furnaces which have been steadily operating will go out for relining.

The Pennsylvania Steel Company blew in the fifth furnace of its Steelton, Pa., group September 1.

No. 2 furnace of the New Jersey Zinc Company, at Palmerton, Pa., was blown in August 2.

The new No. 6 furnace of the Duquesne group of the Carnegie Steel Company was blown in August 11. One Carrie furnace of this company was blown out for repairs August 18.

Both Paxton furnaces of the Central Iron & Steel Company, Harrisburg, Pa., are now in blast, the No. 2 stack having gone in August 25.

The La Belle Iron Works now has both its furnaces at Steubenville in blast for the first time in more than 18 months. Furnace B was blown in August 11.

No. 1 furnace of the Central group of the American Steel & Wire Company at Cleveland, Ohio, which went out for repairs July 31, was blown in August 25.

The blast furnace of the Silver Creek Furnace Company, Rome, Ga., will blow in about September 15.

The furnace of the Stewart Iron Company, Ltd., at Sharon, Pa., which was blown out for repairs August 20, is expected to go in blast again about September 15. Reference has been made heretofore to the extensive improvements at this furnace—the new bin system, ore bridge, electric power house, &c. These will cost about \$225,000.

Rebecca Furnace of the Kittanning Iron & Steel Mfg. Company, which was blown out for repairs May 25, was blown in August 30.

The Athenia Steel & Wire Company, Athenia, N. J., among other improvements is putting in a sprinkler system which will cover the entire plant. The company's duplicate power plant, consisting of boilers, engine and generators, will be in operation the middle of the present month, which will allow for a considerable addition in its already large production. This company's selling agent is the J. Wilkes Company, 135 William street, New York, which reports a large increase in orders and inquiries.

A second furnace of the Wharton Steel Company's group at Wharton, N. J., went in blast September 4.

The Sapulpa Light & Fuel Company, Sapulpa, Okla., which owns a large supply of natural gas adjacent to the city, has closed a contract with the Sapulpa Steel Rolling Mill Company. S. R. Wells, president, to supply fuel for the rolling mill the latter intends to erect. The fuel company has also closed a similar contract for the new brick plant to be erected in that city. There are now under construction at Sapulpa a brick plant to cost \$100,000; packing plant, \$50,000, and foundry and machine shop, \$50,000.

The property of the Southern Car Wheel Iron Company, consisting of a 40-ton charcoal iron furnace located at Tallapoosa, Ga., an ore washing plant, 12 brick charcoal kilns, mining privileges, &c., will be sold at bankrupt sale October 1. Particulars may be had upon application to A. V. Howe, trustee, Tallapoosa.

Sam Lanham Furnace, operated by the State of Texas at Rusk, Texas, is now expected to blow in October 1, after extensive improvements.

The Thomas Iron Company, Hokendauqua, Pa., had all its eight blast furnaces in operation September 1, Keystone and one Saucon having been blown in in August.

The Thomas Furnace Company, Milwaukee, Wis., has blown in its furnace in the past week.

General Machinery.

The Curtis & Curtis Company, Bridgeport, Conn., manufacturer of the Forbes patent die stock, reports a decided improvement in business and is running its plant at full capacity in all departments. This company reports recent sales of two of the largest machines of its manufacture, ranging from 4 to 15 in., to the Davis Coal & Coke Company, Thomas, W. Va.; Atlantic City Electric Company, Atlantic City, N. J.; also large orders for export.

Preparations are being made for the building of locomotives at the Silvis (Ill.) shops of the Rock Island lines, but it is stated by an official that it is not the purpose of the company to engage extensively in this branch of construction. A few switching locomotives will be built, work upon which will be continued from time to time without haste. The principal object of undertaking locomotive construction upon the limited scale contemplated is to retain the working organization, in the machine and boiler shop in slack times. The construction of a planing mill adjacent to the locomotive shops at Silvis is in contemplation, and this improvement will probably be added to

the works in the near future. It will be designed to take care of running repairs to freight cars and will not be a large plant.

J. P. Grady, McAlester, Okla., expects to be in the market this fall for cement making machinery, plans for a 1500-bbl. mill having recently been prepared. It will be located near Harts-horne, Okla.

L. D. Gilbert and A. Moore, Los Angeles, Cal., are engineers for the construction of a 3000-bbl. cement mill which the Victor Portland Cement Company proposes to erect in the vicinity of that city. A contract for the buildings is understood to have been already let, but no machinery has been purchased.

Machinery for a complete crushing plant, including jaw or gyratory breaker, elevators, revolving screens, &c., will be required in the near future by the Elmo (Texas) Rock Company. L. W. Wells, Terrell, Texas, is vice-president and manager.

The Pittsburgh Forge & Iron Company, Pittsburgh, has placed a contract with the Penn Bridge Company, Beaver Falls, Pa., for the erection of a new forge shop. The addition will be of steel construction, 96 x 75 ft., and will be used by the company for the manufacture of shafts for steamboat wheels, locomotive axles and other heavy forgings. The new forge shop will be equipped with two heating furnaces and a heavy steam hammer, which has practically been erected. A 25-ton traveling crane will also be installed. W. G. Wilkins, engineer, Westinghouse Building, is receiving bids for the crane.

The Hazard Engineering Company, recently incorporated at Rochester, N. Y., to engage in the manufacture of automobile and marine motors, transmission gears, clutches, reverse gears and special equipments for high grade motor power plants, has secured for a manufacturing plant a one-story brick building, 140 x 200 ft., with concrete floor, located at Scherer and Maple streets and the New York Central Railroad, Gates, N. Y. Contracts for all machinery required have been placed. Most of the machinery has already been received and installed, and it is expected operations will be commenced next week. The company will specialize at first in the manufacture of its model B motor and transmission in one unit, four-cylinder, 24 hp., for which it now has large orders in hand. E. C. Hazard of the Hazard, Coates & Bennett Company, Rochester, is president and treasurer, and George Hazard vice-president and general manager. The general office of the company will be at Rochester.

The D. H. Stoll Company, Buffalo, N. Y., manufacturer of presses, dies and stamping machinery, has completed plans for a two-story and basement brick and structural iron addition to its plant at Lansing and Military road.

The A. A. Walrath Company, Fort Plain, N. Y., will rebuild the machine shop recently burned. The walls of the old building remain and contract for rebuilding is to be placed in a few days.

Bridges and Buildings.

The Baltimore Bridge Company, Baltimore, Md., through its New York office, has been awarded the contract for furnishing the steel work for the armory of the Twenty-second Regiment, New York, and the general steel contract for the new apartment building to be known as the Cliff Haven, to be erected at the southeast corner of Riverside Drive and 114th street. The company has also contracted with Cramp & Co. for furnishing the structural steel work for the extension to the United States Assay Office, Pine street, east of Nassau, New York.

Foundries.

The Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., will erect a pattern shop 75 x 200 ft., to cost about \$10,000. The shop will be used for making patterns for its customers and when completed the company will be in a position to quote from blue prints, furnishing both patterns and castings. Heretofore the company has not had facilities for making patterns for all its customers.

The American Bronze Company has been incorporated at Buffalo, N. Y., with a capital of \$25,000, to take over the business of the Work Casting Company, which has a brass foundry at Niagara street and West Delavan avenue. The new company will make a specialty of aluminum, manganese, phosphor bronze and red brass castings, and will also make manganese A B C ingots. E. G. Northrop is general manager.

Fires.

The plant of the Prizer-Painter Stove Company at Reading, Pa., was burned September 6, the loss being about \$30,000.

Power Plant Equipment.

Armes & Thornton, Russellville, Ala., who received a franchise for furnishing light and water to the city, are making estimates and surveys for the erection of an electric light plant. Under the terms of the franchise the electric plant must be completed by next July and the water works in 18 months.

A franchise for the establishment of an electric light and power plant at Sugar City, Otero County, Colo., has been asked for by the newly organized Sugar City Electric Light & Power Company, the incorporators of which are R. F. Bornschein, W. F. Bornschein, W. O. Bornschein and H. P. Bornschein.

The Parker Boiler Company, Philadelphia, Pa., has recently received an order from Eberhard Faber, Brooklyn, N. Y., for

two 289-hp. boilers, and Colorado Fuel & Iron Company, Segundo, Colo., one 265-hp. boiler.

Bruce, Fisher & Tuttle, Garrettsville, Ohio, will add a new generating unit to their power plant as soon as certain changes have been decided upon.

An electric lighting station will be erected this year by the city of Peterson, Iowa. The character and capacity of the machinery to be installed has not yet been determined.

A 5000-hp. hydro-electric plant will be constructed by the White Mountain Power Company at Alamogordo, N. M., and centrifugal pumps of large capacity are to be installed in a separate station for irrigation purposes. Contracts for machinery, piping, iron and steel structural parts, culverts, &c., will aggregate a large amount.

Six steam boilers of 150 hp. each, a Corliss engine and electric generator of 200 kw., feed water pumps, heater, alternating current motors and other machinery will be required for the plant of the Escanaba Extract Company, Wells, Mich. The Chas. H. Stehling Company, Milwaukee, will take bids in about four weeks.

Unless satisfactory arrangements are made for hydro-electric power from the Missouri River, the Montana Rapid Transit Company, Helena and Butte, Mont., will construct a steam power station for operating the new Interurban road which it is to build.

Municipal works to furnish electric light, power and water supply have been designed for immediate construction at St. Johns, Kan. Burns & McDonnell, Kansas City, are the city's engineers.

The municipal water works and electric plant at Detroit, Minn., will be enlarged and equipped with machinery of greater capacity.

The city of Douglasville, Ga., will be in the market this fall for new electrical machinery, although plans for the contemplated improvements are subject to change.

Authorities at Lake City, Minn., are considering the addition of a rotary engine of 150 hp. and electric generator in the municipal lighting plant.

Two exhaust steam turbines and alternators of 750 hp. each, with exciters, switchboards, &c., will be installed by the Cherry River Paper Company, Richwood, W. Va.

The Brandon Machinery & Lumber Company, Brandon, Miss., is figuring on the installation of an engine and dynamo with which to light its plant.

An electric power plant and pumping station for municipal service will be built at Millington, Texas, to replace the works recently destroyed by fire. Specifications for the machinery have, however, not yet been prepared.

Pratt City, Ala., will install a modern high duty pumping engine of moderate capacity.

Machinery to supply power for its operation at Red Ash, Va., will be purchased this fall by the Raven Red Ash Company.

A steam power plant, including boiler and engine, is to be purchased by the Clamplitt Gin & Mill Company, Cherry Valley, Ark.

H. Von Schon, engineer, Detroit, Mich., is investigating the opportunities afforded for hydro-electric power with which to operate the quarries in the vicinity of Whitestone, Ga. If his report is favorable one or more power plants will be constructed during the winter and spring months.

An electric power station of about 500 kw. initial capacity will be built at Long Beach, Cal., by the Harbor Electric Light & Power Company.

A small gas engine driven electric generating unit may be purchased in October by the McArthur, Ohio, authorities.

J. H. Werner, St. Charles, Mo., will be in the market shortly for a Corliss engine to furnish power for his new mill, replacing one that burned.

The power plant of the Peoria & Galesburg Railroad will be enlarged next spring, to provide for operating a 60-mile extension of the present system. A steam turbine unit is most likely to be purchased.

New power machinery will be needed this fall by the Courtney Shoe Company, St. Louis, Mo., including a line of electric motors.

The New York, Auburn & Lansing Railroad, Herbert A. Clark, general manager, Ithaca, N. Y., operating a steam road between Auburn and Ithaca, 40 miles, has plans under way for the construction of a 5000-hp. hydro-electric power plant and a fireproof power house building, 50 x 100 ft., on the company's line near Ithaca; also for three transformer stations. The water development will include the construction of a large concrete dam. Work on construction will not be started until next spring. The general contract for equipment has been placed with the General Electric Company, Schenectady.

Hardware.

The National Bolt & Nut Company, Pittsburgh, Pa., has recently made some extensive improvements in and additions to its plant and now has a capacity for turning out 5000 to 6000 kegs per month.

Miscellaneous.

The Iron City Sanitary Mfg. Company, Pittsburgh, is making some improvements to its plant at Zelenople, Pa. This plant is one of the largest and best equipped of its kind in the country and has splendid facilities for turning out enameled ware. The process of molding by machinery is in vogue at the plant, oil is used for fuel, and in all departments there is the most up-to-date system that can be secured for the economical and rapid production of goods. The company's business has increased wonderfully within recent years, its trade at present being exceptionally good, and it is operating to greater capacity than ever before.

Contracts have been placed by the town of Greenfield, Iowa, for the installation of a water works plant, the estimated cost of which is \$25,000. Plans have been drawn and work on construction will be superintended by C. B. Chase of the Clinton Engineering Company, Clinton, Iowa.

Failing in its efforts to purchase the existing plant of the American Water Works Company, the city of North Platte, Neb., has voted a bond issue of \$100,000 to build a municipal water works system.

Contracts for the construction of the works for the Greeley-Poudre Irrigation District, Greeley, Colo., will soon be let. Address Chas. F. Tew for further information.

The Burt Mfg. Company, Akron, Ohio, has received from the officer in charge a very flattering report on the ventilators it installed in the balloon house at Ft. Omaha, Neb. The ventilators are stated to be satisfactory in every respect and to have been very efficient, reducing the temperature and making the atmosphere purer by drawing up all dust and smoke from the lower part of the building.

The Standard Gas & Electric Power Company, Philadelphia, Pa., Samuel S. Eveland, president of the Standard Roller Bearing Company, president, which was organized about two years ago to manufacture touring cars, taxicabs, delivery wagons and auto trucks, has received a large number of orders for its products. The company has expended a large sum of money in developing its various classes of automobiles and the installation of a modern plant which has already been placed in operation. The company will build a 35-hp. touring car and a commercial truck of 3 tons capacity. The feature of the car will be that it will combine gas and electric motive power. It will also have an automatic gear shift operated by the pressing of buttons to do away with the lever system. Another departure will be the manufacture of an individual railroad car for use in interurban traffic on steam roads, to be operated by combined gasoline motor and electric generator.

The building being erected by the Kingsford Foundry & Machine Works, Oswego, N. Y., will be used for office purposes and not as additional foundry and machine shop room.

The Bickford Fire Brick Company, Pittsburgh, plant at Curwinstown, Pa., has recently completed shipment of a blast furnace lining for an Eastern interest, and is now shipping a lining to another concern located East. It reports business to be much improved, due to the increased operations in iron and steel lines.

The Garlock Packing Company, manufacturer of packing for high pressure steam work, Palmyra, N. Y., will start construction in a few weeks on a steel and brick addition, two stories, 50 x 200 ft., to its main manufacturing building. The Garlock Company recently acquired the plant and business of the Triumph Steam Packing Company.

E. S. McLain & Son, Pittsburgh, manufacturers of fire brick and clays, have received a contract from a large steel interest for 300 cars of fire brick, to be delivered to various plants in the Pittsburgh District during the next three months.

The Pittsburgh Valve & Fittings Company, Pittsburgh, with plant at Barborton, Ohio, will hereafter manufacture a line of malleable and gray iron combination fittings for chandeliers.

The Forsyth Steel Tie Company, Pittsburgh, has purchased the entire plant and business of the Pittsburgh Pole & Forge Company, and all of the devices produced in the past will continue to be manufactured by the new company.

The Connellsville Iron Works, Connellsville, Pa., has closed a contract with the Franklin Coke Company, to furnish a complete coking plant near Tippecanoe, Pa. The company will furnish everything in the way of mining equipment from coke scrapers to mine cars and locomotives.

The Board of Sewer Commissioners, Batavia, N. Y., will receive bids until September 25 for the construction of a sewer system and disposal plant to cost approximately \$367,000.

The Welch Motor Company, Detroit, Mich., is remodeling and enlarging its factory at Jefferson and Concord avenues. Some additional equipment will be installed.

The Pittsburg & Westmoreland Railroad has passed under the control of a new company, known as the Irwin & Herminie Traction Company, Irwin, Pa., which will add to the motive power equipment of the road and make other improvements.

Henry A. Mentz, New Orleans, La., will purchase equipment in the spring for a new electric road to connect Jeanerette, La., with nearby towns.

Pig Iron Production.

A New Record by Steel Companies.

Their Output in August More Than That of October, 1907.

The feature of the pig iron statistics for August is the fact that the steel companies, with an output of 1,591,991 gross tons of steel making iron, exceeded their previous record of 1,514,521 tons made in October, 1907, just before the panic. Merchant furnaces are still below their best records, the August product of all coke and anthracite furnaces, 2,246,480 tons, has been exceeded four times, comparing with 2,336,972 tons in October, 1907, and with 2,250,410 tons, 2,255,660 tons and 2,295,505 tons, respectively, in August, July and May of that year. The weekly capacity active at the opening of this month was 525,037 tons, as against 488,742 tons August 1, and 278 furnaces were in blast September 1, a gain of 18 in the month. Production on September 1 was at the record rate of 27,750,000 tons a year, allowing about 1000 tons a day for charcoal iron.

Two new furnaces were blown in in August—Federal of the Federal Furnace Company at South Chicago, and the No. 6 Duquesne of the Carnegie Steel Company. The August production of the United States Steel Corporation furnaces was 1,102,288 tons.

Daily Rate of Production.

The daily rate of production of coke and anthracite pig iron by months, beginning with August, 1908, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
August, 1908.....	28,952	14,899	43,851
September.....	31,117	16,183	47,300
October.....	32,217	18,337	50,554
November.....	32,705	19,890	52,595
December.....	35,172	20,986	56,158
January, 1909.....	35,983	21,992	57,975
February.....	38,367	22,609	60,976
March.....	36,811	22,421	59,232
April.....	36,436	21,526	57,962
May.....	40,531	20,222	60,753
June.....	45,507	19,149	64,656
July.....	48,670	19,123	67,793
August.....	51,354	21,113	72,467

Production of Steel Companies.

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately but are included in the first three columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.			Spiegeleisen and ferromanganese.	
	1907.	1908.	1909.	1908.	1909.
January.....	1,406,397	664,415	1,117,823	20,254	12,325
February.....	1,317,923	745,802	1,073,363	9,402	10,046
March.....	1,424,827	841,502	1,140,553	13,750	23,743
April.....	1,446,788	725,548	1,093,092	12,363	22,478
May.....	1,470,080	759,674	1,256,448	17,823	20,834
June.....	1,457,230	717,689	1,365,527	15,958	16,516
July.....	1,452,557	798,639	1,508,762	10,250	17,613
August.....	1,445,685	897,052	1,591,991	14,932	22,313
September.....	1,417,153	933,514	.....	8,938	.....
October.....	1,514,521	996,481	.....	12,174	.....
November.....	1,084,114	981,167	.....	15,882	.....
December.....	659,459	1,090,339	.....	6,510	.....

The number of active furnaces of the United States Steel Corporation and of the independent steel companies at the beginning of each month since January appears below:

	Steel Corporation.	Independent steel companies.
Furnaces in blast February 1.....	62	49
Furnaces in blast March 1.....	65	45
Furnaces in blast April 1.....	66	39
Furnaces in blast May 1.....	68	42
Furnaces in blast June 1.....	77	48
Furnaces in blast July 1.....	82	50
Furnaces in blast August 1.....	93	52
Furnaces in blast September 1.....	97	57

As only steel making iron is reckoned in the above, the Steel Corporation's merchant iron furnaces in Alabama and its one Bay View stack which is making foundry iron, are not included; nor are the two Lebanon Valley furnaces of the Lackawanna Steel Company and the Ala-

bama furnaces of the Republic Iron & Steel Company, all of which make foundry iron.

August Product by Districts.

The table below gives the production of all coke and anthracite furnaces in August and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)	August. (31 days)
New York.....	91,283	112,669	123,792	152,249	173,317
New Jersey.....	19,798	19,836	18,590	19,002	22,765
Lehigh Valley.....	46,463	58,176	52,464	55,646	58,607
Schuylkill Val.....	54,004	52,755	46,004	47,323	48,105
Lower Susquehanna and Lebanon Val.....	45,973	52,687	52,361	50,738	54,713
Pittsburgh Dis.....	403,981	446,656	479,362	524,102	538,294
Shenango Val.....	77,434	103,783	110,004	128,251	143,722
West Penn.....	129,543	128,413	112,975	118,904	118,174
Md., Va. and Kentucky.....	63,311	60,143	54,448	52,551	67,752
Wheeling Dis.....	46,696	63,980	94,664	111,620	125,281
Mahoning Val.....	171,107	171,811	175,949	196,593	207,887
Central and North. Ohio.....	119,226	125,554	135,319	148,969	153,797
Hocking Valley, Hanging Rock and S. W. Ohio.....	43,841	38,995	32,908	26,872	26,804
Mich., Minn., Mo., Wis., Colo.....	55,995	58,045	59,187	57,008	61,980
Chicago Dis.....	211,776	250,363	263,126	287,106	282,668
Alabama.....	136,909	119,823	101,280	106,482	139,131
Tennessee, Georgia and Texas.....	21,537	19,641	18,433	20,015	23,483
Totals.....	1,738,877	1,883,330	1,930,866	2,103,431	2,246,480

Capacity in Blast September 1 and August 1.

The following table shows the weekly capacity of furnaces in blast September 1 and August 1, the furnaces blown in in July being rated on the records of previous performance:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	September 1. Number in blast.	September 1. Capacity per week.	August 1. Number in blast.	August 1. Capacity per week.
New York:					
Buffalo.....	16	16	37,380	15	33,516
Other New York.....	7	3	3,702	3	3,720
New Jersey.....	8	4	5,138	4	4,750
Spiegel.....	2	0	0	0	0
Pennsylvania:					
Lehigh Valley.....	25	15	13,706	13	11,834
Spiegel.....	3	2	574	1	140
Schuylkill Valley.....	15	8	10,864	8	11,164
Low. Susquehanna.....	7	6	8,320	4	6,628
Spiegel.....	1	1	575	1	610
Lebanon Valley.....	10	6	5,590	5	5,290
Pittsburgh Dist.....	48	45	121,110	44	120,008
Spiegel.....	2	2	2,480	2	1,862
Shenango Valley.....	20	17	31,850	18	30,025
W. Pennsylvania.....	27	18	28,826	16	27,076
Maryland.....	4	3	5,750	2	4,466
Wheeling District.....	14	12	28,966	11	25,970
Ohio:					
Mahoning Valley.....	20	17	46,942	17	44,394
Central and North. and Michigan.....	22	18	40,455	16	36,767
Hocking Valley, Hanging Rock and S. W. Ohio.....	15	8	6,052	8	6,314
Illinois and Indiana.....	29	25	66,996	23	61,418
Spiegel.....	2	1	1,242	1	1,395
Minnesota and Wis.....	7	4	4,622	4	4,208
Missouri and Colo.....	7	4	7,247	4	7,167
The South:					
Virginia.....	23	11	8,455	10	6,974
Kentucky.....	5	1	705	1	650
Alabama.....	46	22	31,850	21	27,706
Tennessee.....	18	9	5,640	8	4,690
Georgia & Texas.....	3	0	0	0	0
Totals.....	406	278	525,037	260	488,742

The list of furnaces blown in in August or on September 1 includes No. 3 Lackawanna at Buffalo, Keystone, one Saucon and No. 2 Palmerton in the Lehigh Valley, the new No. 6 Duquesne and Neville Island in the Pittsburgh District, Emporium and Rebecca in western Pennsylvania, one Paxton and one Steelton in the lower Susquehanna Valley, Sheridan in the Lebanon Valley, Dora of the Virginia Iron, Coal & Coke Company, one Maryland Steel Company at Sparrows Point, one La Belle in the Wheeling District, one Columbus (Carnegie) and one Columbus Iron & Steel Company in Ohio, Belfont in the Hanging Rock District, one Calumet, one Federal and one South Chicago in the Chicago District, two Ensley in Alabama and Citico and Rockdale in Tennessee. Among furnaces blown out in August were one Carrie in the Pittsburgh District, Stewart in the Shenango Valley, Marting in the Hanging Rock District, one Joliet in Illinois, one Clifton in Alabama and Standard in Tennessee.

A Record of Active Capacity.

The active weekly capacity in coke and anthracite

iron has shown the following fluctuations since January 1, 1907, the figures representing gross tons:

	Capacity per week		Capacity per week
September 1, 1909...	525,037	April 1.....	264,890
August 1.....	488,742	March 1.....	267,437
July 1.....	463,029	February 1.....	241,925
June 1.....	446,096	January 1, 1908...	235,152
May 1.....	412,010	December 1, 1907...	347,372
April 1.....	409,217	November 1.....	491,436
March 1.....	420,807	October 1.....	511,397
February 1.....	414,497	September 1.....	507,768
January 1, 1909...	401,994	August 1.....	513,471
December 1, 1908...	381,102	July 1.....	528,170
November 1.....	362,685	June 1.....	528,220
October 1.....	387,925	May 1.....	524,538
September 1.....	315,112	April 1.....	496,456
August 1.....	284,590	March 1.....	511,035
July 1.....	264,452	February 1.....	492,359
June 1.....	259,284	January 1, 1907....	507,397
May 1.....	268,674		

The Curve of Pig Iron Production.

Now that so close an approach has been made to the high points of pig iron production in 1907, it will be

Abrasive Material Production in 1908.

The total value of the natural abrasive materials produced in the United States in 1908, according to a report by W. C. Phalen, of the United States Geological Survey, was \$1,074,039, a decline of \$606,698 from the figures for 1907. The value of the artificial abrasives produced was \$626,340, a decline of \$400,906 from the 1907 value. The value of the imports amounted to \$476,073, a decrease of \$278,067. The total value of the abrasive materials consumed in this country during the year was therefore \$2,176,452.

The natural abrasives include oil-stones and scythe-stones, grindstones and pulpstones, buhrstones and mill-stones, pumice, infusorial earth and tripoli, abrasive quartz and feldspar, garnet, corundum and emery. These were produced in 23 States. The artificial abrasives

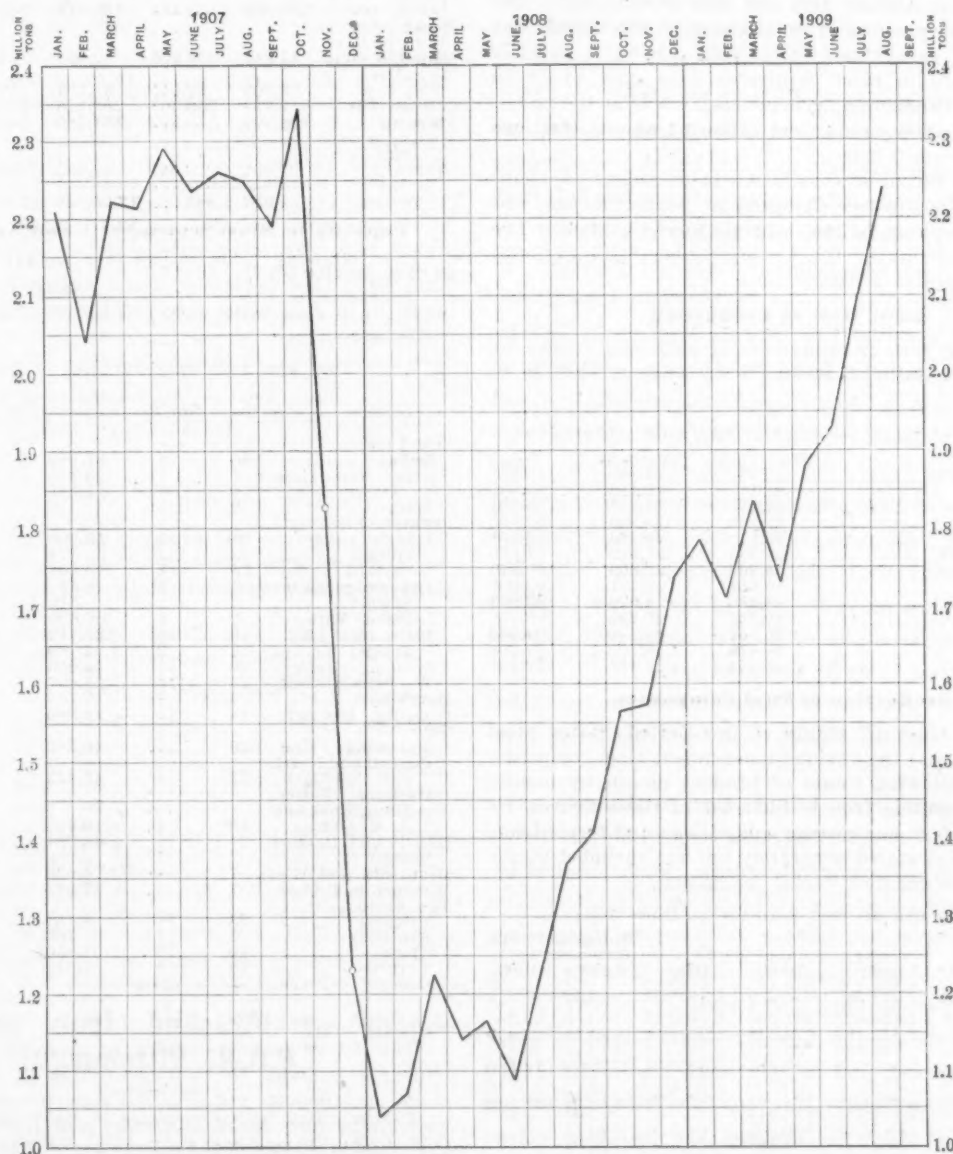


Diagram of Coke and Anthracite Pig Iron Production in the United States by Months.

interesting to note the dips and ascents of the curve of production since the beginning of 1907. They are shown in the accompanying diagram. The figures plotted in the chart giving production by months are as follows:

Production of Coke and Anthracite Pig Iron in the United States by Months in 1907, 1908 and 1909.—Gross Tons.

	1907.	1908.	1909.
January	2,205,607	1,045,250	1,797,560
February	2,045,068	1,077,740	1,707,340
March	2,226,457	1,228,204	1,832,194
April	2,216,558	1,149,602	1,738,877
May	2,295,505	1,165,688	1,883,330
June	2,234,575	1,092,131	1,929,884
July	2,255,660	1,218,129	2,103,431
August	2,250,410	1,359,831	2,246,480
September	2,183,487	1,418,998	.....
October	2,336,972	1,567,198	.....
November	1,828,125	1,577,854	.....
December	1,234,279	1,740,912	.....

comprise alundum and carborundum, which are manufactured only at Niagara, N. Y., and crushed steel. Mr. Phalen's report contains details of the domestic production and imports of these different materials, and notes on the methods of preparing them for the market.

The Mesta Machine Company, Pittsburgh, has just made the following shipments: Richard Heckscher & Sons Company, Swedeland Furnace, Swedeland, Pa., a 44 and 84 by 60 in. high pressure long cross head blowing engine; Marlon Steam Shovel Company, Marlon, Ohio, a 26 and 48 by 48 in. Corliss engine; Watrous Engine Works Company, Ltd., Brantford, Ont., Canada, a 72-in. type A Helander barometric condenser.

The Iron and Metal Trades

The full reports from the steel makers to *The Iron Age* show that their make of pig iron beat all records, having been 1,591,991 gross tons in August, as compared with 1,514,521 tons made in October, 1907, just before the panic. Their production has risen from a daily rate of 36,000 tons in January to 51,354 tons in August. In the meantime, the output of the merchant furnaces has fluctuated since January within the narrow range of 19,000 tons per day and 22,000 tons per day, having been 21,113 tons per day in August. While this does not take into account the recent reduction in the stocks of pig iron, yet it does show how comparatively slowly the merchant furnaces have recovered.

The markets for crude and finished iron and steel are firm and in some respects buoyant, but the conservative element in the trade is beginning to bring forward arguments in favor of caution and moderation. Prices are reaching a point where importations are possible. At such exposed sections like the Pacific Coast sales of foreign finished material have already been made. An interesting fact is that a large Pacific Coast steamship interest has purchased 50,000 tons of Chinese pig iron, and has already placed a considerable part thereof with melters on the Pacific Coast for forward delivery. Domestic prices on bars and shapes are reaching a level at Atlantic and Gulf ports, which, with the new rates of duty, are very close to the importing point. What foreign makers can do in the way of low prices is shown by a sale of a round lot of German beams and channels at Buenos Aires at £5 2s. per gross ton.

Recent rail sales are not numerous or important, but it is understood that negotiations involving large quantities are in progress.

The structural trade has not been particularly active lately, and east of the Alleghenies competition has grown somewhat keener among fabricators. With lessened opportunities for securing work in the West, fabricators in the Central West are seeking an outlet in the Eastern territory. An inquiry is in the market for four rolling lift bridges for the Cape Cod Canal.

The material for the three lake boats placed last week has been ordered, and to this there was added 14,000 tons of plates and shapes for four lake freighters for ore interests, for which the contract has just been placed with the American Shipbuilding Company. The cessation of the strike at the plant of the Pressed Steel Car Company will bring upon the plate mills a volume of specifications long held in abeyance.

Pittsburgh makers of merchant iron pipe have announced an advance of \$4 per ton, while the mills making shafting have put up the price \$3 per ton.

The minimum price in steel bars is now 1.40c., Pittsburgh, and a leading interest is now taking contracts for delivery through the first quarter of next year at that price. There is some disposition to make slightly higher prices on structural material and plates for the first quarter.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

Sept. 8, Sept. 1, Aug. 11, Sept. 9,
1909. 1909. 1909. 1908.

PIG IRON, Per Gross Ton:

Foundry No. 2, standard, Philadelphia.....	\$17.75	\$17.75	\$17.00	\$16.50
Foundry No. 2, Southern, Cincinnati.....	17.25	16.75	16.25	15.50
Foundry No. 2, local, Chicago.....	18.50	18.50	17.00	17.35
Basic, delivered, eastern Pa.....	18.00	18.00	17.00	15.25
Basic, Valley furnace.....	15.75	15.50	15.25	14.50
Bessemer, Pittsburgh.....	17.90	17.65	16.90	15.90
Gray forge, Pittsburgh.....	15.90	15.65	15.15	14.40
Lake Superior charcoal, Chicago	19.50	19.50	19.50	19.50

BILLETS, &c., Per Gross Ton:

Bessemer billets, Pittsburgh.....	25.00	25.00	24.00	25.00
Forging billets, Pittsburgh.....	29.00	29.00	28.00	27.00
Open hearth billets, Philadelphia	27.50	27.50	27.00	26.20
Wire rods, Pittsburgh.....	31.00	31.00	31.00	33.00
Steel rails, heavy, at mill.....	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:

Steel rails, melting, Chicago....	16.00	16.00	16.00	13.00
Steel rails, melting, Philadelphia	17.25	17.25	17.00	15.25
Iron rails, Chicago.....	19.00	19.00	18.50	16.75
Iron rails, Philadelphia.....	20.00	20.00	19.75	20.00
Car wheels, Chicago.....	17.75	17.00	16.00	15.50
Car wheels, Philadelphia.....	16.50	16.50	15.50	15.00
Heavy steel scrap, Pittsburgh.....	17.25	17.25	16.00	14.25
Heavy steel scrap, Chicago.....	15.75	15.50	14.75	13.00
Heavy steel scrap, Philadelphia	17.25	17.25	17.00	15.25

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia.	1.50	1.50	1.45	1.45
Common iron bars, Chicago....	1.45	1.40	1.37½	1.50
Common iron bars, Pittsburgh..	1.50	1.50	1.45	1.40
Steel bars, tidewater, New York	1.56	1.51	1.46	1.56
Steel bars, Pittsburgh.....	1.40	1.35	1.30	1.40
Tank plates, tidewater, New York	1.56	1.56	1.56	1.76
Tank plates, Pittsburgh.....	1.40	1.40	1.40	1.60
Beams, tidewater, New York....	1.56	1.56	1.56	1.76
Beams, Pittsburgh.....	1.40	1.40	1.40	1.60
Angles, tidewater, New York...	1.56	1.56	1.56	1.76
Angles, Pittsburgh.....	1.40	1.40	1.40	1.60
Skelp, grooved steel, Pittsburgh.	1.40	1.40	1.35	1.45
Skelp, sheared steel, Pittsburgh.	1.50	1.50	1.45	1.50

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.50
Wire nails, Pittsburgh.....	1.80	1.80	1.80	1.95
Cut nails, Pittsburgh.....	1.75	1.75	1.75	1.85
Barb wire, galv., Pittsburgh*...	2.10	2.10	2.10	2.40

METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	13.50	13.50	13.62½	13.87½
Electrolytic copper, New York..	13.12½	13.25	13.25	13.50
Spelter, New York.....	5.85	5.85	5.75	4.75
Spelter, St. Louis.....	5.70	5.70	5.60	4.60
Lead, New York.....	4.40	4.40	4.30	4.60
Lead, St. Louis.....	4.30	4.30	4.15	4.45
Tin, New York.....	29.95	30.25	29.85	28.60
Antimony, Hallett, New York...	8.37½	8.00	8.12½	8.00
Nickel, New York.....	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York...	\$3.64	\$3.64	\$3.64	\$3.89

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steels and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.40c., net; I-beams over 15 in., 1.50c., net; H-beams over 8 in., 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.45c., net; angles, over 6 in., 1.50c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.60c., base, half extras, steel bar card; tees, 3 in. and up, 1.50c., net; tees, 3 in. and up, 1.45c., net; angles, channels and tees, under 3 in., 1.35c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.65c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered $\frac{1}{4}$ -in. plate. Steel plates over 72 in. wide must be ordered $\frac{1}{4}$ -in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under $\frac{1}{4}$ -in. to and including 3-16-in. plates on thin edges.....	\$0.10
Gauges under 3-16-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete circles.....	.20
Boiler and flange steel plates.....	.10
"A. B. M. A." and ordinary firebox steel plates.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in.....	.05
For widths over 110 in. up to 115 in.....	.10
For widths over 115 in. up to 120 in.....	.15
For widths over 120 in. up to 125 in.....	.25
For widths over 125 in. up to 130 in.....	.50
For widths over 130 in.....	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c.; box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c.; Galvanized Sheets, Nos. 13 and 14, 2.25c.; Nos. 15 and 16, 2.35c.; Nos. 17 to 21, 2.50c.; Nos. 22 to 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3.05c.; No. 28, 3.25c.; No. 29, 3.35c.; No. 30, 3.60c. Painted roofing sheets, No. 28, \$1.55 per square. Galvanized roofing sheets, No. 28, \$2.80 per square for $2\frac{1}{2}$ in. corrugations.

Wrought Pipe.—Discounts on steel pipe, $\frac{3}{4}$ to 6 in., in carloads to the largest trade, are 81 and 5 per cent. off list, and on iron pipe, $\frac{3}{4}$ to 6 in., are 75 and 5 per cent. off list.

Boiler Tubes.—Regular discounts are as follows:

Boiler Tubes.	Steel.
1 to $1\frac{1}{2}$ in.....	.50
$1\frac{3}{4}$ to $2\frac{1}{4}$ in.....	.62
$2\frac{3}{4}$ to 5 in.....	.70
$2\frac{1}{2}$ in.....	.64
6 to 13 in.....	.62
$2\frac{1}{2}$ in. and smaller, over 18 ft. long, 10 per cent. net extra.	
$2\frac{3}{4}$ in. and larger, over 22 ft. long, 10 per cent. net extra.	

Wire Rods.—Bessemer, open hearth and chain rods, \$31 to \$32.

Steel Rivets.—Structural rivets, 1.80c., base; boiler rivets, 1.90c., base, subject to usual extras.

Chicago.

FISHER BUILDING, September 8, 1909.—(By Telegraph.)

With the leading steel mills provided with specifications sufficient to assure the operation of their finishing departments for the rest of the year and orders still accumulating faster than they can be taken care of, industrial prosperity seems once more to be approaching flood tide. The only disturbing feature of the present situation is found in a pronounced and increased congestion of order books which is retarding deliveries in nearly all of the heavier lines of steel mill products. Prompt mill shipments of bars, plates and shapes, and sheets also in some instances, are commanding premiums over ruling quotations where sellers see fit to exact them. Jobbers' stocks are in consequence being drawn upon more heavily for immediate wants and the spread between store and mill prices is widening in corresponding ratio. This tendency will doubtless become more accentuated as the mills fall further behind in the execution of orders, a result that in view of present conditions seems likely to be realized. The event of chief market interest, so far as new business is concerned, is the addition of 60,000 tons of standard rails to the bookings of the Illinois Steel Company. This is especially desirable since it consists principally of open hearth specifications, thus diverting it to the Gary mill, where it can be handled to the best advantage. This mill now has business enough booked to keep it going at a faster gait for the rest of the year than it has been running so far. The railroads are also a prominent factor in the increased demand for other lines of finished material, including wire nails and fencing. Pig iron producers are seemingly disinclined to contract the output of their furnaces as far in advance as they have done in former years. Comparatively little has been booked beyond the first quarter of next year. Whatever is the motive back of this policy, it will at least limit the extent of speculative buying and possibly tend to steady the market.

Pig Iron.—The last local seller of Southern iron at \$13.50, Birmingham, for this year's delivery, has withdrawn this price and is asking \$14 for all deliveries up to the end of the first quarter of 1910. This places the market square-

ly upon \$14 as the minimum for Southern iron covering this period, beyond which no figures are quoted by Southern interests. As indicative of the large amount of iron that has been contracted for by consumers within recent weeks, it is stated by a leading sales agency that in point of quantity its bookings for August in this market were the heaviest in its history. While no lots of exceptional size were included in the sales of last week, the aggregate entered was fairly heavy. The character of demand was such as to indicate a state of increasing activity among melters; at the same time it is hardly likely that the rate of actual consumption is fully up to the mark set by such purchases. It is evident that in anticipation of possible delays that are likely to occur later on by reason of a threatened car shortage, a good many melters are endeavoring to increase their stock piles. The leading Southern interest has temporarily withdrawn from the market and is quoting no prices for any delivery. The only local furnace open for additional orders is making a flat price of \$18.50, Chicago, for present and future shipments through the first quarter and first half of next year. Sales of Northern iron aggregating between 25,000 and 30,000 tons were made last week, the demand being widely distributed. A Wisconsin threshing machine interest is taking figures on 2000 tons of No. 2 foundry, and a prominent steel foundry has an inquiry out for 3000 to 5000 tons of basic. No signs of weakness are apparent in the present situation, which has every appearance of being backed by conditions favoring stability. The following quotations are for September delivery, f.o.b. Chicago:

Lake Superior charcoal.....	\$19.50 to \$20.00
Northern coke foundry, No. 1.....	19.00 to 19.50
Northern coke foundry, No. 2.....	18.50 to 19.00
Northern coke foundry, No. 3.....	18.00 to 18.50
Northern Scotch, No. 1.....	18.50 to 19.00
Southern coke, No. 1.....	18.85 to 19.35
Southern coke, No. 2.....	18.35 to 18.85
Southern coke, No. 3.....	17.85 to 18.35
Southern coke, No. 4.....	17.35 to 17.85
Southern coke, No. 1 soft.....	18.85 to 19.35
Southern coke, No. 2 soft.....	18.35 to 18.85
Southern gray forge.....	16.85 to 17.35
Southern mottled.....	16.60 to 17.10
Malleable Bessemer.....	18.50 to 19.00
Standard Bessemer.....	19.10 to 19.35
Jackson Co. and Kentucky silvery, 6 %.....	19.90 to 20.49
Jackson Co. and Kentucky silvery, 8 %.....	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10 %.....	21.90 to 22.40

Billets.—The local market continues to be wholly dependent upon outside producers for billets. The demand for forging billets from Western forge shops, railroads and machinery builders is steadily increasing, but such consumers are compelled to look to Eastern steelmakers for their requirements.

Rails and Track Supplies.—The Illinois Steel Company booked new standard section rail orders last week amounting to 45,000 tons, to which is added 15,000 tons entered this week, making in all 60,000 tons of new business secured. This new buying represents the requirements of Western lines, the largest single order being for 30,000 tons. It also includes 4000 tons placed by a new Idaho road, together with a number of less important lots from miscellaneous sources. Nearly all of these rails are for deliveries beginning in November and extending through the first quarter of next year, and with the exception of 10,000 tons all are open hearth and will be rolled by the Gary mill. In addition to the heavy specifications for track fastenings being offered, a considerable volume of new business is being placed by various roads, all of which are clamoring for shipments of this material. Trade in light rails is picking up. The Illinois Steel Company's August business in light rails was the best within the past six months. Prices are firm at the following quotations: 40 to 45 lb. sections, \$26; 30 to 35 lb. sections, \$26.75; 16, 20 and 25 lb. sections, \$27; 12-lb. sections, \$28, Chicago, less 50c. a ton on lots of 500 tons and \$1 a ton on lots over 500 tons.

Structural Material.—The leading feature of interest last week in the local market was the closure of a general contract for the new Sherman House, including 5000 tons of steel, which was taken by John Griffith & Sons. The contract for the steel has not yet been placed. The National Realty Building Company, Tacoma, Wash., awarded a contract for 877 tons to the Des Moines Bridge & Iron Company. The Brown & Ketchum Iron Works, Indianapolis, Ind., will fabricate 1000 tons, to be used in the construction of the Municipal Court Building, St. Louis. The Woodford Building, Joliet, 450 tons, went to the Decatur Bridge Company. Quite a number of small fabricating orders are coming out, the aggregate of which is considerable. Builders are finding it exceedingly difficult to get material through the shops fabricating it without considerable delay. The leading interest is not promising deliveries on heavy work short of January 1. Aside from the Sherman House contract, proposals were asked last week in this market on 18,000 tons, of which 12,000 tons was secured by the independent shops. The mill situation as to deliveries on plain material is not improving; specifications, in fact, are being offered at a rate exceeding the output capacity. Mill prices are firm at a minimum of 1.58c., base, Chicago, with some mills asking 1.63c., base, Chicago. Jobbers have advanced prices on ma-

terial from store to 1.85c., base, Chicago, which is said to be rigidly maintained.

Plates.—Producers are bending their efforts to meet the demand of consumers for deliveries, many of which are long overdue. With specifications pouring in on all sides no progress is being made in this direction. While the volume of new business will not compare with that of the period when bottom prices were being made, it is nevertheless fairly heavy. No better than 1.58c., Chicago, is being offered on mill shipments, and the independent mills are not seeking business under 1.63c., Chicago. Store prices have advanced on plates to 1.85c., and such stocks are being heavily drawn upon for immediate requirements.

Sheets.—The local mill is well filled up and has nothing to offer for shipment prior to the latter part of November or early in December. The demand for blue annealed sheets is conspicuously strong and prices have firmed up to 1.88c. for No. 10 on shipments from mill. The corresponding price from store is 2.20c. to 2.30c. Buyers of light sheets, both black and galvanized, are coming into the market freely with specifications and orders.

Bars.—With specifications piling up faster than the mills can take care of them, together with new business of considerable volume that is being offered, the situation as respects deliveries is naturally not improving. All of the mills are congested and shipments of steel bars earlier than 60 to 90 days are practically out of the question. Owing to the fact that the bar iron mills are able to turn out orders more promptly, more business is being diverted to them, and they are now all running full. Steel bars are firm at 1.53c., Chicago, with some mills asking 1.58c. Bar iron has advanced to a minimum of 1.45c., and some business is reported at 1.50c., Chicago.

Merchant Pipe.—Trade in merchant pipe is holding fairly steady, as is shown by the fact that business for August ran about even with that of July. Jobbers are buying for current requirements about as they have been for some time past, but it is likely that in the near future their wants will have to be anticipated further ahead. Rumors of an impending advance are still heard, but no change from the present scale has up to this time been announced.

Boiler Tubes.—Mill shipments of seamless boiler tubes are running from four to five weeks behind, but lap welded merchant tubes are being furnished with reasonable promptness. There is a better movement in locomotive tubes, some roads having recently placed contracts covering shipments up to January 1.

Cast Iron Pipe.—Outside of the usual run of small orders and municipal lettings of unimportant size, no transactions of note are reported. A firmer tendency in prices has developed in sympathy with the rising level in pig iron prices, but no actual advance has as yet been announced. We quote per net ton, Chicago, as follows: Water pipe, 4-in., \$27.50; 6 to 12 in., \$26.50; 16-in. and up, \$25.50, with \$1 extra for gas pipe.

Metals.—The market is quiet throughout. Sales of copper include no transactions of notable size, but consist mainly of purchases for immediate consumption. Spelter, which was showing some signs of activity a week ago, has settled back into comparative dullness. Prices are without noteworthy change. Quotations are as follows: Casting copper, 13 $\frac{1}{4}$ c.; lake, 13 $\frac{1}{4}$ c. to 14c., in car lots, for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{8}$ c. higher; pig tin, car lots, 32 $\frac{1}{2}$ c.; small lots, 33c.; lead, desilverized, 4.45c. to 4.55c., for 50-ton lots; corroding, 4.70c. to 4.80c., for 50-ton lots; in car lots, 2 $\frac{1}{2}$ c. per 100 lb. higher; spelter, 5.75c. to 5.85c.; Cookson's antimony, 10 $\frac{1}{2}$ c., and other grades, 9 $\frac{1}{4}$ c. to 10 $\frac{1}{4}$ c.; sheet zinc is \$7.50, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13 $\frac{1}{4}$ c.; copper bottoms, 11 $\frac{1}{2}$ c.; copper clips, 12 $\frac{1}{4}$ c.; red brass, 11 $\frac{1}{2}$ c.; yellow brass, 9 $\frac{1}{4}$ c.; light brass, 6 $\frac{1}{4}$ c.; lead pipe, 4 $\frac{1}{2}$ c.; zinc, 4.50c.; pewter, No. 1, 23c.; tin foil, 25c.; block tin pipe, 27c.

Old Material.—The scrap market holds strong, with an upward tendency that in the past few days has resulted in further advances on some of the leading grades. Several holders of large stocks are declining to consider offers at anywhere near the present level, believing that still higher prices will prevail. Turnings and borings are in good demand, with some sales for shipment to the Pittsburgh District. In sympathy with the rise in pig iron, foundry melting stock is firmly held at higher prices. A sale of 750 tons of agricultural malleable cast at \$13.50 is reported. A small lot of No. 1 railroad wrought on a list closed last week brought \$15.35. All material coming on the market is readily absorbed. There is a good deal of inquiry for old car wheels, but offerings are light. A small lot changed hands at \$17.75, while the sale of 1000 tons for delivery 60 days ahead at \$18 is noted. The surplus stock held by railroads is rapidly being absorbed on exchange contracts for new wheels, but a large stock of old wheels in outside hands is being held for still higher prices. No individual transactions involving large quantities of material are reported, but inquiries in the market from important consuming interests are believed

to foreshadow heavy purchases. It is to this cause that a good deal of the feverish excitement which characterizes the present market is attributed. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails.....	\$19.00 to \$19.50
Old steel rails, rerolling.....	16.75 to 17.25
Old steel rails, less than 3 ft.....	16.00 to 16.50
Relaying rails, standard sections, subject to inspection.....	22.50 to 23.50
Old car wheels.....	17.75 to 18.25
Heavy melting steel scrap.....	15.75 to 16.25
Frogs, switches and guards, cut apart.....	15.50 to 16.00
Shoveling steel.....	14.75 to 15.25

The following quotations are per net ton:

Iron angles and splice bars.....	\$18.00 to \$18.50
Iron car axles.....	20.50 to 21.00
Steel car axles.....	18.50 to 19.00
No. 1 railroad wrought.....	15.00 to 15.50
No. 2 railroad wrought.....	14.00 to 14.50
Springs, knuckles and couplers.....	14.75 to 15.25
Locomotive tires, smooth.....	16.00 to 16.50
No. 1 dealers' forge.....	12.25 to 12.75
Steel axle turnings.....	11.50 to 12.00
Machine shop turnings.....	9.25 to 9.75
Cast and mixed borings.....	6.75 to 7.25
No. 1 busheling.....	12.50 to 13.00
No. 2 busheling.....	9.50 to 10.00
No. 1 boilers, cut to sheets and rings.....	11.50 to 12.00
No. 1 cast scrap.....	14.75 to 15.25
Stove plate and light cast scrap.....	12.50 to 13.00
Railroad malleable.....	15.00 to 15.50
Agricultural malleable.....	12.25 to 12.75
Pipes and flues.....	11.50 to 12.00

Cincinnati.

CINCINNATI, OHIO, September 8, 1909.—(By Telegraph.)

A firm tone prevails throughout the iron, steel and machinery markets in this center. Orders for machine tools continue active and an increasing number of plants are out of stock and behind on orders. Specifications on contracts in the finished lines of iron and steel have been liberal and mill deliveries are from four to eight weeks in arrears. Pig iron continues active with a good volume of inquiry for delivery in the first quarter and first half of 1910, and prices show an advancing tendency.

Pig Iron.—Most of the Southern furnaces are demanding \$14, Birmingham, for No. 2 foundry, for all deliveries, but so far as can be learned no business has been booked by them beyond the first quarter of next year. There is so little inquiry for prompt shipment and for the balance of this year that it is difficult to determine whether the price quoted a week ago of \$13.50, Birmingham, has disappeared. A few sales were made late last week on the \$13.50 basis, but late information to-day makes it appear that \$14, Birmingham, is the lowest quotation obtainable. Trade opinion indicates that investment iron in the hand of brokers and commission houses has been closely sold up, which is bringing the market nearer to furnace quotations. It is also believed and confirmed by the action of the market that investors are holding their iron up to the prices demanded by the producers. While \$14, Birmingham, is generally quoted, but few of the producers in the South are authorizing sales agents to seek business on this basis, and the iron available for first quarter is to a certain extent limited, as most transactions are the result of the submitting of firm offers and acceptances by the furnaces. Northern iron has been advanced to a basis of \$16, at furnace, for No. 2 foundry for this year's delivery, and some of the producers in southern Ohio are asking \$16.50 for No. 2 at furnace for first half of next year, but \$16 can still be done for next year in a limited way. It is reported that a large consumer in Detroit is in the market for 6000 to 10,000 tons of foundry iron for next year's delivery, and has already closed for a portion of it with a Detroit furnace. An Ohio consumer has closed for 5000 to 10,000 tons of steelmaking iron for deliveries commencing at once and running into next year. It is reported that a Pennsylvania furnace has taken some business for the last half of 1910 at a premium over the first half. The leading pipe interest is in the market for a liberal quantity and has bought about 2000 tons during the week in this market. An Eastern cast iron pipemaker is inquiring for prices on 2400 tons for this year's delivery. For prompt shipment and delivery over the balance of this year, based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$17.75
Southern coke, No. 2 foundry.....	17.25
Southern coke, No. 3 foundry.....	16.75
Southern coke, No. 4 foundry.....	16.25
Southern coke, No. 1 soft.....	17.75
Southern coke, No. 2 soft.....	17.25
Southern coke, gray forge.....	\$15.00 to 15.50
Ohio silvery, 8 per cent. silicon.....	19.70
Lake Superior coke, No. 1.....	17.70
Lake Superior coke, No. 2.....	17.20
Lake Superior coke, No. 3.....	16.70
Standard Southern car wheel.....	22.25 to 23.75
Lake Superior car wheel.....	20.50 to 21.00

(By Mail.)

Coke.—The market is showing more strength from day to day. The operators furnishing coke to consumers in this

territory are asking advances in prices on most propositions put up to them for consideration. While there is not much going on in the way of contracting, there is an occasional foundry willing to contract for first half of next year, but most of the consumers have covered for the balance of this year. It is expected that disappointments in deliveries will bring about a more urgent call for spot coke in the near future. There is a good movement of coke on contracts, and foundries are taking in their supplies in good volume, and some are keeping their yards pretty well stocked. Prices in the Connellsville District are showing a strong upward tendency and quotations for this year's delivery range from \$2.35 to \$2.50 per net ton, at oven, for foundry coke, and for next year delivery from \$2.40 to \$2.75. Furnace coke for first half of next year ranges from \$2.25 to \$2.50, at oven. Wise County foundry coke for this year's delivery is quoted at from \$2.10 to \$2.25, at oven, and furnace coke for prompt shipment ranges from \$1.75 to \$1.85. Contracts for next year's delivery would be on a higher basis than for prompt shipment. Pocahontas foundry coke is quoted at \$2 to \$2.25 and furnace coke at \$1.85 to \$2 for last half delivery, at oven.

Old Material.—The market is strong, with dealers firm holders. There is only a moderate amount of scrap offering in this market and the supplies in the yards, while rather large, are not increasing. The largest consumer here is well stocked and is holding off at the prices demanded. Dealers are willing to make contracts for forward deliveries based upon a scale which would give them the benefit of any advance there may be in the market, but for any large tonnage for immediate delivery the asking prices are very strong. We quote dealers' prices here as follows:

No. 1 R. R. wrought, net ton.....	\$14.50 to \$15.00
Cast borings, net ton.....	8.00 to 8.50
Heavy melting steel scrap, gross ton..	15.00 to 15.50
Steel turnings, net ton.....	9.00 to 9.50
No. 1 cast scrap, net ton.....	14.00 to 14.50
Burnt scrap, net ton.....	10.00 to 10.50
Old iron axles, net ton.....	18.50 to 19.00
Old iron rails, gross ton.....	15.75 to 16.25
Old steel rails, short, gross ton.....	14.00 to 14.50
Old steel rails, long, gross ton.....	15.00 to 15.50
Relaying rails, 56 lb. and up, gross ton	21.50 to 22.00
Old car wheels, gross ton.....	14.50 to 15.50
Low phosphorus scrap, gross ton.....	14.00 to 14.50

Finished Iron and Steel.—Specifications on contracts are good and the movement of iron and steel shapes to consumers and jobbers is in liberal volume. Jobbers are taking in all descriptions of stock as fast as they can get deliveries from the mills. Mills are from four to eight weeks behind on shipments, and a few sales are being made at premiums over contract prices where deliveries are important to the consumer and a mill can be found which may have some certain material wanted for reasonably early delivery. There is no change in prices reported not already made public. Steel bars are still quoted on the basis of 1.35c., Pittsburgh.

St. Louis.

ST. LOUIS, September 6, 1909.

The local representatives of the leading iron and steel companies, while enjoying a good demand, express themselves as confident of a still further improvement. In addition to the business done with jobbers and large consumers, the demand from the railroads is growing in volume. Agents are now beginning to experience difficulty in placing orders for railroad supplies for as prompt shipment as wanted and state that the market is advancing in various finished products. As reflected by the prompt payment of taxes, St. Louis merchants and manufacturers are in easy circumstances financially, the receipts being larger than at the call last year. The increase in the taxable wealth of the State for the fiscal year is over \$34,000,000. Bank clearings for August show a handsome gain over those of the corresponding month in 1908, and likewise over August, 1907. The demand for money continues fair and rates are steady at 4½ to 5 per cent. on call and time loans.

Coke.—Owing to the advance in the Connellsville District, prices are a trifle higher in this market. The consensus of opinion seems to be that consumers will not be inclined to oppose an appreciation in the price of coke in view of the advance in pig iron and the improvement in general business conditions. Really, it would appear surprising that present values did not obtain earlier in the season in view of the situation in the iron market at the time. Brokers report more inquiry and a growing urgency to have specifications on contract coke shipped promptly, particularly owing to an increasing delay in shipments being loaded out. It is also noted that the movement of freight en route is slower than formerly. We quote for standard 72-hr. foundry spot shipment \$2.35; balance of 1909, \$2.50; first half, 1910, \$2.50 to \$2.65, at oven, Connellsville.

Pig Iron.—In pig iron, as in other staples, there being two classes of buyers—the large consumer and the smaller one—it is necessary to separate them in referring to current market conditions. A canvass of the leading sellers indicates that the interest of the large buyers is wholly centered in deliveries of pig iron over the first quarter and half

of 1910 and in St. Louis territory this interest is principally in Southern iron. The feature of the situation is the difficulty of naming firm prices for round lots. Some of the brokers have prices, it is true, but, being out of line, they are merely nominal. A number of furnaces, on the other hand, refuse to name prices at present for any delivery. Merchant sellers owning stocks at the furnaces are willing to make figures now, as has been the case right along, but for 1910 delivery it would appear that buyers and sellers are apart in their views. Sellers seem to look for better prices to obtain in the near future so far as 1910 iron is concerned, and doubtless in this are mainly influenced by the tenor of advices from producing districts. There is also a belief that consumers' stocks are being rapidly reduced and the inquiry for iron will later on become more urgent. In some instances manufacturers wish to engage the iron to protect them on contracts which they can make for their specialties. In view of these conditions it is not surprising to find business mainly confined to the trade of small buyers situated at outside points, principally for delivery over the balance of the year. In the aggregate these sales for the week foot up in most offices quite satisfactorily and warrant the statement that business is good and the outlook encouraging for still greater activity. While the new tariff may exert some influence toward holding the market down, on the other hand the higher cost of coke and the growing demand from railroads will, it is believed, more than offset this feature. One firm reports a buyer in the market for a round lot of malleable iron for the last quarter of 1909 and first quarter of 1910; another house has an inquiry for 5000 tons of basic for shipment over the first quarter of 1910. It is becoming quite difficult to place orders for No. 2 Southern foundry at \$13.50, Birmingham, for shipment over the balance of the year, \$14 being the price at which this iron is now held. We hear of \$14 being named for the same iron for shipment over the first quarter of 1910, the quantity, however, subject to confirmation.

Lead, Spelter, Etc.—The market for lead is quiet at 4.27½c. Spelter is dull, buyers and sellers being apart on prices; the market is firm at 5.60c. to 5.62½c., East St. Louis. Zinc ore is held at \$49 per ton, Joplin base. Tin, antimony and copper remain unchanged at last week's prices. The demand for finished goods shows a satisfactory tonnage, somewhat better than last week.

Old Material.—Though to some extent a dealers' market, there is sufficient demand coming from all classes of consumers to impart a firm tone to the situation; in fact, dealers are asking higher prices for some items in the list. Relaying rails continue scarce and wanted at full prices. There is this week but one railroad list on the market, that of the Frisco, 1100 tons. There has been some further reduction in stocks in dealers' hands. We quote prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$16.00 to \$18.50
Old steel rails, rerolling.....	16.00 to 16.50
Old steel rails, less than 3 ft.....	15.75 to 16.25
Relaying rails, standard sections, subject to inspection.....	24.50 to 25.00
Old car wheels.....	17.00 to 17.50
Heavy melting steel scrap.....	16.00 to 16.50
Frogs, switches and guards, cut apart.....	16.00 to 16.50

The following quotations are per net ton:

Iron fish plates.....	13.75 to 14.25
Iron car axles.....	20.50 to 21.00
No. 1 railroad wrought.....	15.25 to 15.75
No. 2 railroad wrought.....	14.25 to 14.75
Railroad springs.....	13.75 to 14.25
Locomotive tires, smooth.....	14.50 to 15.00
No. 1 dealers' forge.....	11.00 to 11.50
Mixed borings.....	7.50 to 8.00
No. 1 boilers, cut to sheets and rings..	11.00 to 11.50
No. 1 cast scrap.....	13.50 to 14.00
Stove plate and light cast scrap.....	10.75 to 11.25
Railroad malleable.....	13.00 to 13.50
Agricultural malleable.....	12.00 to 12.50
Pipes and flues.....	11.00 to 11.50
Railroad sheet and tank scrap.....	10.50 to 11.00
Railroad grate bars.....	10.75 to 11.25
Machine shop turnings.....	9.50 to 10.00

The Illinois Traction Company, the holding company of the McKinley railroad, lighting and heating companies, has increased its capital stock from \$12,000,000 to \$16,000,000. This increase was authorized chiefly to provide additional funds for the extensive improvements at St. Louis, which will cost approximately \$5,000,000. The company also proposes to construct belt lines at Edwardsville, Springfield and Decatur.

The Cleveland Furnace Company has given a contract to the Semet-Solvay Company, Syracuse, N. Y., for the tearing down and rebuilding on a much larger scale of the coke plant of the Retort Coke Oven Company, Cleveland, which was purchased by the Cleveland Furnace Company last year after the coke oven company went into the hands of a receiver. The Semet-Solvay Company will erect Semet-Solvay ovens and will operate the new plant for some time. It is expected that it will have an output of about 500 tons of coke a day.

Pittsburgh.

PARK BUILDING, September 8, 1909.—(By Telegraph.)

Pig Iron.—Some large sales have been made and prices are showing a strong tendency toward higher values. The United States Steel Corporation is badly in need of iron, and may buy 40,000 to 50,000 tons of Bessemer through the Bessemer Pig Iron Association, providing the iron can be secured from the furnaces. A local steel interest has bought 10,000 tons of standard Bessemer from a Mahoning Valley furnace that is now out of blast, at \$16.75, at furnace, for delivery over the balance of the year. A new buyer of pig iron in the market is the West Penn Steel Company, whose new sheet and bar mill plant at Brackenridge, Pa., will be in operation in a short time. This company bought about 4000 tons of basic on the basis of \$15.50, Valley furnace, for delivery over the balance of the year. A local steel interest has also picked up from various Valley furnaces 4000 to 5000 tons of basic at \$15.50, at furnace. It is doubtful whether any more Bessemer iron could be had at less than \$17 at furnace and basic at less than \$15.75 at furnace. These prices being quoted to-day. There have been some sales of foundry iron at \$15.75, Valley furnace, for No. 2. We note a sale of 350 tons of Bessemer at \$17, Valley furnace; 500 tons of basic at \$15.50, Valley furnace, for prompt shipment, and 200 tons of malleable Bessemer for prompt shipment at \$16, Valley furnace. We quote standard Bessemer, \$17; basic, \$15.75; No. 2 foundry, \$15.75 to \$16; malleable Bessemer, \$16, and gray forge, \$15, all at Valley furnace, for balance of this year delivery, the freight to Pittsburgh being 90c. a ton.

Steel.—A new seller of sheet bars in the local market is the West Penn Steel Company, whose mills will probably be in operation in October or early in November. This company has already sold some sheet bars for delivery later in the year. The steel market continues very strong, steel being scarce for prompt delivery. We quote Bessemer billets, 4 x 4 in., at \$25 to \$25.50; open hearth billets, \$26 to \$26.50, and forging billets, about \$29, all f.o.b. Pittsburgh, full freight added. Sheet and tin bars in random lengths are very firm at \$26.50 to \$27, Pittsburgh, full freight added. Standard, 4 x 4 in., Bessemer billets are \$25, and random length sheet and tin bars \$26, f.o.b., Youngstown, full freight added. A sale of 1000 tons of long length sheet bars is reported at \$26.50, Pittsburgh, for prompt delivery.

(By Mail.)

The best news of the week is that the long strike at the McKees Rocks Works of the Pressed Steel Car Company has been settled, both sides having made concessions. On the part of the company the principal concessions made are that the pooling system of paying the employees will be stopped, and the men will receive an advance in wages within the next 60 to 90 days. The men also withdrew some important demands made when the strike started. Very great satisfaction is expressed that this bitter strike, costly to both sides, has been settled. The Pressed Steel Car Company secures practically its entire supply of plates and small shapes from the Carnegie Steel Company, but has been buying practically nothing for the past two months. The company has a good many orders on its books for steel cars, and will no doubt soon be specifying for material. There seems to be no falling off whatever in the volume of new business or in specifications for iron and steel products, and the point has almost been reached with several of the largest steel companies that they will not take orders for delivery under three or four months. The Carnegie Steel Company last week received orders and specifications for its various products representing twice as much material as it has capacity to roll. This company will not accept orders for material for delivery prior to the middle of November, and other leading steel interests are about in the same shape. The pipe manufacturers are having a heavy volume of business, and during the week prices on iron pipe were advanced about two points, or \$4 a ton, from the lowest point. As yet no change has been made in prices of steel pipe, but this may now come at any time. The situation in pig iron is very tight, it being practically impossible to gather up a big tonnage of iron, the furnaces being so well sold up. Bessemer iron has practically reached \$17 at Valley furnace, and all other grades of iron are very firm. The scrap market is very strong, material being scarce and higher prices are quoted. Coke has also shown a sharp advance and standard makes of furnace coke for balance of the year delivery are now held firm at \$2.40 to \$2.50 per net ton at oven. Press reports that 40,000 tons of pig iron are to be imported into this country by a leading consumer are misleading. This probably refers to spiegeleisen, which is being imported steadily, a recent lot of 25,000 tons having been brought over from the other side of the Atlantic.

Ferromanganese.—Inquiries for this material continue active, and consumption is heavier than at any time in the past two years, as consumers are operating their mills to full capacity. Prices are very firm and we quote foreign 80 per cent., at \$43 to \$43.50, seaboard, the freight to Pittsburgh being \$1.95 a ton. Sales of 300 to 400 tons are reported for delivery this year at these prices.

Ferrosilicon.—A continued strong demand is noted, and sales of carloads and larger lots are being made almost daily. Prices are firm and show indications of going higher. We quote \$23 for 10 per cent. blast furnace ferrosilicon, \$24 for 11 per cent., and \$25 for 12 per cent., while 50 per cent. is now held at \$64 to \$64.50, f.o.b. Pittsburgh.

Muck Bar.—The activity in operations among the bar iron mills has created a heavy demand for muck bar and the available supply is limited. A sale of 1000 tons for delivery over the balance of the year is reported at about \$28.50, Pittsburgh, for all pig iron muck bar. We quote best grades, made from all pig iron, at \$28.50 to \$29, Pittsburgh.

Skelp.—Makers report a continued heavy demand for both steel and iron plates, and the market is very firm, prices showing indications of going still higher. Several mills that make a specialty of rolling sheared iron plates are filled up for the next 60 to 90 days, and cannot take orders for delivery before late in October. Prices are firm, and we quote grooved steel skelp at 1.40c. to 1.45c.; sheared, 1.50c. to 1.60c.; groove iron, 1.65c. to 1.70c., and sheared iron plates, 1.80c. to 1.85c., all for ordinary widths and gauges, f.o.b. Pittsburgh.

Steel Rails.—As yet no rail orders for 1910 delivery have been placed with the Carnegie Steel Company, but a number of leading roads are figuring on their requirements for next year, and are expected to place contracts within the next month or two. The company received some small orders for standard sections last week for delivery this year, and also new orders and specifications against contracts for about 2600 tons of light rails. The three Edgar Thomson rail mills at Bessemer are all in operation, and running to 60 per cent. or more of capacity. We note a heavy demand for steel axles and splice bars. Steel axles are firm at 1.65c. to 1.70c., and splice bars are also firm at 1.50c., Pittsburgh. We quote light rails as follows: 12 lb., \$30; 16 and 20 lb., \$29; 25 lb., \$28; 30 and 35 lb., 40 and 45 lb., \$27, f.o.b. Pittsburgh. We quote standard sections at \$28, at mill.

Plates.—The settlement of the strike at the steel car plant of the Pressed Steel Car Company means the releasing by that company to the Carnegie Steel Company in the near future of a heavy tonnage in plates and small shapes held up during the strike. The contract for the plates and shapes for the three boats taken recently by the Great Lakes Engineering Works have been placed with a local mill, the order amounting to nearly 20,000 tons. As boat building will be active this fall and winter, the plate mills are expecting to receive heavy orders for plates and shapes from this source later in the year. The leading plate mills are now considerably behind in deliveries and the situation in this respect is getting steadily worse. If the present rate at which orders and specifications are being received is maintained, it will only be a short time until some of the mills will be taking orders subject to shipment at their convenience. The absolute minimum on ¼-in. and heavier plates is 1.40c. in large lots and 1.45c. to 1.50c. in small lots.

Structural Material.—In the past week the local office of the American Bridge Company has taken contracts for 8000 to 10,000 tons of shapes made up mostly of small orders, and the McClintic-Marshall Construction Company has also booked some fairly large contracts. The Jones & Laughlin Steel Company has taken about 1500 tons of steel for new buildings for the Ayer Mills at Lawrence, Mass. Parties who were contemplating erecting structures some time ago and neglected to place their contracts are now confronted with considerably higher prices from the fabricating concerns. We quote beams and channels up to 15-in. at 1.40c., Pittsburgh, in large lots, and 1.45c. to 1.50c. in small lots.

Tin Plate.—There is a seasonable dullness in the demand for tin plate, but the leading mills have heavy contracts on their books against which buyers are specifying liberally and are thus assured of full work for the next two or three months. The American Sheet & Tin Plate Company is steadily increasing its operations in tin mills affected by the strike, and it is expected that within a month or so it will have sufficient men to operate these mills as fully as conditions may warrant. The tin plate mills are so well filled up with business that a few of the smaller makers are asking premiums of 10c. to 15c. a box for prompt shipment, and, it is said, in some cases are getting them. The American Sheet & Tin Plate Company has not announced its prices for next year's delivery, nor have any of the leading independent mills. We continue to quote tin plate at \$3.40 per base box for 100-lb. cokes, f.o.b. Pittsburgh.

Sheets.—The demand for sheets and specifications against contracts are so heavy and the mills are so well filled up that most of them are not taking orders for shipment prior to October, and some mills cannot promise deliveries before November. The sheet market is undoubtedly more active than it has been at any time in nearly two years. Minimum prices on box annealed, one pass black sheets are 2.20c. for No. 28 and 3.25c. for No. 28, galvanized. Roofing sheets are firm at \$1.55 per square for painted corrugated and \$2.80 for galvanized corrugated, 2½-in. corrugations.

Jobbers charge the usual advances over these prices for small lots from store.

Bars.—The new demand for iron and steel bars and specifications against contracts continue heavy, and are in excess of rolling capacity of the mills. The Carnegie Steel Company is practically sold up on its output of steel bars to November, and Republic and Jones & Laughlin are about in the same position. None of the leading mills will now take orders for shipment within 60 days from date, and the Carnegie Steel Company will not promise deliveries on new orders before the middle of November. All the leading mills are now holding steel bars at 1.40c., minimum, and sales of small lots amounting to a considerable quantity have been made at 1.45c. to 1.50c., at mill. We also note a heavy demand for iron bars, and the mills are getting pretty far back in deliveries. We quote iron bars at 1.50c., minimum, f.o.b. Pittsburgh.

Hoops and Bands.—Trade continues active, and consumers are also specifying liberally against contracts placed some time ago, when prices were lower than they are now. We quote hoops at 1.45c., minimum, this price still being made by one leading maker, but the general market is 1.50c. to 1.55c. Bands are 1.35c. to 1.40c., with steel bar card extras.

Shafting.—Effective September 1, there was a general advance in cold rolled shafting of three points in the discounts, or \$3 a ton. Consumers who placed contracts some time ago at 60 and 60 and 5 off are specifying liberally, and shipments by the mills are heavy. Some of these contracts expire October 1, while others run to January 1. We now quote cold rolled shafting at 57 per cent. off in carloads and 52 per cent. in less than carloads, delivered in base territory, with proportionate advances for delivery in all other territories.

Spikes.—Recently the Chicago & Northwestern was in the market for 30,000 to 40,000 kegs of railroad spikes for 1910 delivery, and this business is believed to have been taken by a Western mill. The Jones & Laughlin Steel Company has taken a good sized order for railroad spikes for shipment to Mexico. There has been a slight advance in prices, and we now quote railroad spikes, $4\frac{1}{2}$ x 9-16 in. and larger, at \$1.70 and for smaller sizes and boat spikes \$1.75, base, subject to standard card extras, with an advance of 5 cents per keg in less than carload lots. All the spike-makers are operating their plants to full capacity and have orders ahead for several months.

Rivets.—While the new demand is very active, consumers are also specifying liberally against contracts for rivets placed some time ago when prices were lower than they are now. The market is very firm at the recent advance of \$2 a ton. We quote structural rivets, $\frac{3}{4}$ in. and larger, at 1.80c., base; cone head boiler rivets, $\frac{3}{4}$ in. and larger, 1.90c., base; $\frac{5}{8}$ in. and 11-16 in. take an advance of 15c., and $\frac{1}{2}$ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Merchant Pipe.—As indicating the great activity in demand and the liberal specifications being received against contracts, we can state that actual orders and specifications received in August by the National Tube Company were only exceeded in two former months in the history of this company. There is an inquiry in the market for 15 miles of 6 $\frac{1}{4}$ -in. casing. The inquiry of the Monongahela Natural Gas Company for 15 miles of steel pipe for delivery in Greene County has not yet been placed. The trade is still anticipating an early advance in prices of steel pipe, but no announcement of this has yet been made. Several of the iron pipe mills have made an advance of about two points, or \$4 a ton, in prices of iron pipe. The official discount on black steel pipe, $\frac{3}{4}$ to 6 in., is 81 and 5, and on iron pipe, $\frac{3}{4}$ to 6 in., 75 and 5, in carload and larger lots to the wholesale trade. These prices are absolutely minimum, jobbers charging the usual advances to the smaller trade for shipment from store.

Boiler Tubes.—The demand for both merchant and locomotive tubes is steadily improving and this trade is now in better shape, both as regards demand and prices, than it has been at any time in more than a year. The official discounts on locomotive and merchant tubes, printed on another page, are, however, still being shaded by some mills.

Iron and Steel Scrap.—The scarcity and heavy demand for pig iron, together with the higher prices ruling, are reflected in scrap, prices on which are very firm and showing a decided tendency toward higher values. Some dealers have oversold and are picking scrap up as fast as they can to cover their shorts. While prices are not materially higher than last week, some dealers are quoting from 25c. to 50c. advance over our prices, which are as follows: Heavy steel scrap, \$17.25 to \$17.50; cast iron borings, \$11 to \$11.25; No. 1 cast scrap, \$16; No. 2, \$15; bundled sheet scrap, \$15.25 to \$15.50; No. 1 railroad malleable, \$16 to \$16.50; low phosphorus melting stock, \$21 to \$21.50; sheet bar crop ends, \$18.50 to \$19; grate bars, \$13 to \$13.50; steel axles, \$21.50 to \$22; rerolling rails, delivered Newark, Huntington or Cumberland, \$17.50; locomotive tires, \$19 to \$19.50; lo-

comotive axles, \$26 to \$26.50; old car wheels, \$17.50; machine shop turnings, \$13 to \$13.25; iron axles, \$26 to \$26.50; No. 1 busheling scrap, \$15; No. 2, \$11.50 to \$12; and No. 1 railroad wrought scrap, \$18 to \$18.25. All above prices are in gross ton, f.o.b. Pittsburgh, unless otherwise noted. Bundled sheet scrap continues very strong in the East, and a good deal of this material is still being sent there from Pittsburgh.

Coke.—The principal trouble in the coke trade at present is not lack of demand, but difficulty in getting enough men to operate the ovens and secure a full output. Practically all the cokemakers are suffering severely from the shortage in labor, while the water supply at several plants has also failed, causing them to close down. There is plenty of demand to take all the coke that the ovens can turn out, but the operators are not getting a full output for the above reasons. There has been a sharp advance in prices, and we now quote standard makes of furnace coke for delivery over this year at \$2.40 and up to \$2.50 per net ton at oven. Best makes of 72-hr. foundry coke are held at \$2.50 per net ton at oven for this year's delivery. The output of coke in the Upper and Lower Connellsville regions last week was 416,354 tons, an increase over the previous week of about 19,000 tons. There are 38,483 ovens in these two regions, of which last week 30,962 were active and 7521 idle.

James D. Dyer, formerly salesman with the United Iron & Steel Company, and Frank T. Moorhead of Moorhead Bro. & Co., Inc., of Pittsburgh, have formed partnership under the firm name of James D. Dyer & Co., 604 People's Bank Building, Pittsburgh, to deal in pig iron, coke, &c.

Philadelphia.

PHILADELPHIA, PA., September 7, 1909.

Increasing strength is observed in practically every branch of the iron and steel trade. Notwithstanding the holiday, a good volume of business has continued to come out, particularly in finished lines. Makers of both crude and finished product are offered more business than they can conveniently take care of, and consumers are particularly anxious to make contracts for extended deliveries, which, however, are refused, even in some instances at a higher range of prices. Deliveries are becoming less prompt, and some classes and grades of both crude and rolled products are becoming scarce. Prices are steadily moving upward and fear is expressed that the forward movement is too rapid, and will invite the importation of both pig iron and steel products. There is a steady gain in consumption, and new records for production are being made. Comparatively little business has been placed for early 1910 delivery, as producers refuse to accept orders for any material quantities, as it is generally believed that higher prices will prevail later in the year.

Pig Iron.—The market is strong in every department, and in a number of instances prices have been further advanced. The aggregate of business placed during the week has been somewhat smaller, due probably to the intervening holiday, but the demand continues strong. While the bulk of the foundry iron transactions have been in small and moderate lots for delivery during the balance of the present year, buyers show increasing desire to place business for early 1910 delivery. Sales of varying quantities running up to 1000 tons are reported at prices which show considerable range. As low as \$18.25, delivered, has been done when certain circumstances prevailed for a fair sized lot of No. 2X for first half delivery, while small quantities have been sold as high as \$19, delivered. The majority of sellers are holding at about \$18.50, delivered, for No. 2X for shipment during the first quarter. For delivery over the balance of this year \$17.75 can still be done in a few instances, although the principal sellers are taking orders at \$18 to \$18.25. The quantities taken, however, have not been large individually as sellers are for the most part pretty well sold up for near future deliveries. Low grade foundry irons and forge iron for pipemaking are being freely inquired for, but there is little available, and prices are slowly advancing. One Eastern cast iron pipemaker is understood to have bought about 4000 tons in the past few weeks, the total being made up of small lots at a varied range of prices. Virginia foundry grades are fairly active; the orders taken in this immediate vicinity have been mostly for early delivery, for which the leading interest asks \$15, at furnace, for No. 2X, equal to \$18, delivered, but small lots may still be had for spot shipment at a shade under that figure from outside sellers. Practically no movement in Southern foundry iron is reported by sellers here. While \$13.50, Birmingham, can still be done for prompt No. 2 foundry, several producers are reported to have advanced their prices 50 cents. At the former level these prices are higher than for Eastern brands. Forge iron has not been active; some small lots for puddling have been sold at unchanged prices, although several producers have advanced quotations. Basic iron has not been so actively bought, although melters still have inquiries out for considerable quantities, both for this year and first half of 1910.

Requirements for the balance of this year are not yet fully covered as far as some of the steel works are concerned, and a premium of 50 cents a ton was paid for a small lot for early delivery. The leading producers of basic would still accept business at \$18 either for this year or the first half of next year, although several sellers have advanced their asking prices 50 cents a ton for the first half of 1910 delivery, but without resulting in business. The immediate situation, as far as delayed deliveries of basic iron are concerned, is somewhat better and several producers are shipping more freely than they were, additional capacity having been put on that grade. The new Crane stack of the Empire Steel & Iron Company at Catsauqua, with a capacity of 300 tons per day, was put in during the week; while it will be operated on foundry iron for a time, it will shortly be run on basic. Low phosphorus iron is firm; while no sales of importance have been made, quotations in some instances have been marked up. The market fully maintains its strength in all departments, with prices of foundry grades steadily moving upward. Sellers make no effort to dispose of their product—in fact, frequently have little to sell; but buyers seem perfectly willing to pay the prices named, which for delivery in buyers' yards, eastern Pennsylvania and nearby points, during the remainder of the year, range about as follows, an advance of about 50 cents a ton being quoted in the majority of cases for early 1910 deliveries:

Eastern Pennsylvania, No. 2 X foundry.....	\$17.75 to \$18.25
Eastern Pennsylvania, No. 2 plain.....	17.25 to 17.75
Virginia, No. 2 X foundry.....	17.75 to 18.00
Virginia, No. 2 plain.....	17.50 to 17.75
Gray forge.....	16.50 to 17.00
Basic.....	18.00
Low phosphorus.....	21.00

Ferromanganese.—A somewhat better demand is reported and prices are on a more uniform basis. One moderate quantity, as well as several smaller lots, both for prompt and first half of 1910 delivery, have been sold at prices ranging about \$42, Baltimore, for this year's delivery, and \$43 to \$44, Baltimore, for the first half of next year.

Billets.—A moderate volume of business continues to come out, the bulk of the orders being for small lots for early delivery at unchanged prices—\$27.50 delivered in this vicinity, for ordinary rolling steel. Considerable inquiry for billets for extended delivery is noted, but no business of that character has been done. Forging billets have been fairly active at unchanged prices, namely, \$29.50 to \$30 at Eastern mill, for ordinary forging steel for prompt shipment; the usual extras applying for high carbons and special sizes.

Plates.—The demand continues to broaden, and practically all the local mills are running at full capacity. Orders are largely for near future delivery, as mills refuse to contract or take orders for shipment beyond the end of the year. Several good sized orders have recently been taken in lots of 1000 to 1500 tons, principally for car work, while a heavy volume of business in ship plates is shortly expected to be placed. Prices are steadily moving upward; one mill has advanced the price of universal plates to 1.65c., delivered, but still quotes sheared plates at 1.60c. delivered, for minimum carload lots, which represents about the average price of heavy steel plates.

Structural Material.—Buying has been confined principally to moderate and smaller lots, the aggregate of which has been large, and mills are fully employed, with deliveries on some lines steadily hardening. Several orders for material for buildings have been recently booked, covering quantities ranging from 200 to 400 tons, together with a good average volume of miscellaneous business. Prices are advancing, and 1.60c., delivered, represents about the minimum carload lot price for ordinary plain material.

Sheets.—The mills have booked some fairly heavy orders for forward shipment, for which buyers pay an advance over the price for prompt delivery, ranging from \$1 to \$2 a ton, dependent upon circumstances. A sharp demand continues, and order books are rapidly assuming very satisfactory shape. For prompt shipment the following range of prices is quoted: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

Bars.—More business is noted. Buyers come into the market more freely, and several mills have booked quite good orders for refined iron bars for early shipment at 1.55c., delivered. Prices are moving upward, 1.50c., mill, being asked in some instances, although 1.45c., mill, can still be done; the present range of quotations for early delivery in this territory being 1.50c. to 1.60c. for refined iron bars, with steel bars at 1.50c. to 1.55c., delivered.

Coke.—More activity is observed in the coke market. Inquiries for both furnace and foundry coke for the last quarter of this year and the first half of next are numerous, but sellers refuse to book orders except at materially higher prices. Considerable interest in coke for next year's shipment is shown, and prices as high as \$2.50 per net ton at oven have been named for both grades. Prompt foundry coke is now held at \$2.25 to \$2.35 at oven, while prompt furnace coke is quoted from \$1.90 to \$2 at oven. For delivery in this territory during the balance of the year, the following range of prices is named:

Connellsville furnace coke.....	\$4.15 to \$4.25
Foundry coke.....	4.50 to 4.60
Mountain furnace coke.....	3.75 to 3.85
Foundry coke.....	4.10 to 4.20

Old Material.—The market is strong, but there is little movement in any grade. No change is noted in the heavy melting steel situation; fresh tonnages taken by the mills are reported to be very light, and further developments are awaited with interest by both sides. Steel scrap is scarce, and those who have any are holding for higher prices. Sales in other grades of old material have been light, and prices are a trifle higher. Machinery cast shows an upward movement, due to the increasing price of pig iron. Railroad wrought also shows a slight advance. The following range of prices, while to some extent nominal, is quoted for moderate lots, for prompt delivery in buyers' yards, eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops.....	\$17.25 to \$17.50
Low phosphorus.....	20.50 to 21.00
Old steel axles.....	23.00 to 23.50
Old iron axles.....	25.50 to 26.00
Old iron rails.....	20.00 to 21.00
Old car wheels.....	16.50 to 17.00
Choice No. 1 R. R. wrought.....	20.00 to 20.50
Machinery cast.....	15.75 to 16.25
Railroad malleable.....	15.00 to 16.00
Wrought iron pipe.....	17.00 to 17.50
No. 1 forge fire scrap.....	15.00 to 15.50
No. 2 light iron.....	10.00 to 10.50
Wrought turnings.....	14.00 to 14.50
Stove plate.....	13.50 to 14.00
Cast borings.....	12.25 to 12.75
Grate bars.....	14.25 to 14.75

Buffalo.

BUFFALO, N. Y., September 7, 1909.

Pig Iron.—The market continues very strong, and prices have hardened perceptibly. Orders making a good aggregate have been booked by furnaces during the past week, mostly for foundry irons, but including some malleable, for various deliveries up to July 1 next. A considerable volume of business is also under negotiation for first half deliveries. We quote for balance of year and first quarter deliveries, f.o.b. Buffalo, as follows:

No. 1 X foundry.....	\$16.50 to \$17.00
No. 2 X foundry.....	16.25 to 16.75
No. 2 plain.....	15.75 to 16.25
No. 3 foundry.....	15.50 to 15.75
Gray forge.....	15.25 to 15.50
Malleable Bessemer.....	16.25 to 16.75
Basic.....	17.00 to 17.50
Charcoal.....	19.50 to 20.00

Finished Iron and Steel.—The demand continues extremely good in all lines. New business is being received in round lots for the extended deliveries which can be promised—60 to 90 days for bars and six to eight weeks for plates and shapes. Canadian export business continues heavy, especially for agricultural implement and structural and bridge material, with the demand active in general lines. Uninterrupted activity is shown in building and structural lines and much new business is in sight. Plans are in progress by local architects for a seven-story hotel for the Akron Hotel Company, Akron, Ohio, which will require a large quantity of steel, and bids are soon to be received for the structural steel, concrete reinforcing bars and expanded metal for the new White Face Inn, to be erected at Lake Placid, N. Y., at a cost of \$250,000. Bids are to be called for next week for steel for the Lynde Haven apartment house, Buffalo, requiring 100 tons; also for a graded school building at Auburn, N. Y., requiring a like amount, and for steel for the Selden Motor Vehicle Company's factory in Rochester, about 200 tons.

Old Material.—The market shows an advancing tendency all along the line, except for heavy melting steel, and a noticeably strong demand for iron axles, the price for which has risen conspicuously. The demand has not been from local consumers, as they are comfortably well supplied in most lines for the present and are not actively in the market, but from outside sources, principally Pittsburgh and eastern Pennsylvania. We quote dealers' prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel.....	\$16.00 to \$16.50
Low phosphorus steel.....	20.00 to 21.00
No. 1 railroad wrought.....	16.50 to 17.00
No. 1 railroad and machinery cast scrap.....	15.50 to 16.00
Old steel axles.....	20.00 to 21.00
Old iron axles.....	23.00 to 23.50
Old car wheels.....	16.00 to 16.50
Railroad malleable.....	16.00 to 16.50
Boiler plate.....	14.00 to 14.50
Locomotive grate bars.....	12.50 to 13.00
Pipe.....	13.00 to 13.50
Wrought iron and soft steel turnings.....	10.50 to 11.00
Clean cast iron borings.....	8.50 to 9.00
No. 1 busheling scrap.....	14.00 to 14.50
No. 2 busheling scrap.....	10.50 to 11.50

Hazard, Mudge & Co. is the name of a new company formed at Buffalo, N. Y., composed of interests represented in the Hazard, Coates & Bennett Company, Rochester, N. Y., and Edmund W. Mudge & Co., Pittsburgh, Pa. Of the new company, E. C. Hazard is president, H. N. Trimble, vice-

president; E. W. Mudge, treasurer, and John Bennett, secretary. The business of both the Hazard, Coates & Bennett Company at Rochester and Edmund W. Mudge & Co. at Pittsburgh is carried on as heretofore. Hazard, Mudge & Co. will take on and continue the iron and steel scrap business at Buffalo heretofore operated as a branch by the Hazard, Coates & Bennett Company, and will operate in connection therewith the yards at Lackawanna, N. Y., formerly owned by that company, comprising six acres and the most up to date equipment, including locomotive cranes, magnet, heavy shears, &c., and now known as the Lackawanna Storage Yards, Inc. Furthermore, Hazard, Mudge & Co. will handle various lines of pig iron and steel products in conjunction with Edmund W. Mudge & Co. of Pittsburgh, in which E. C. Hazard through this arrangement became interested on September 1.

The American Bridge Company has closed its office in Syracuse, N. Y., and added the central New York territory, formerly tributary to that office, to the jurisdiction of W. B. Ogram, contracting manager, with offices at 660-662 Elliott Square Building, Buffalo. The new arrangement extends the sales territory, over which Mr. Ogram will have charge, eastward from Rochester to Syracuse, Utica, Elmira, Binghamton, Ithaca, Auburn, Oswego, Ogdensburg, Watertown, Cornwall and Malone.

Cleveland.

CLEVELAND, OHIO, September 7, 1909.

Iron Ore.—The demand continues quite good. One firm reports the sale of 40,000 tons of non-Bessemer and siliceous ore, and others have closed contracts for a considerable quantity in small lots. There is still a fair volume of inquiries. Some furnace interests seem in a quandary as to what ore to buy, not having decided fully what grade of iron they will make. As was expected, the August movement of ore down the lakes broke all former records, having been 7,193,199 tons, a gain of 386,389 tons over the record made in August, 1907. The movement up to September 1, this year, was 22,589,547 tons, or 1,753,005 tons less than during the same period of 1907, the banner year. Showing the development of the Lake Superior ore industry, it is of interest to note that the shipments during August exceeded those of any entire season prior to 1889. Shipments are now as heavy as last month, and it is expected that the September movement will be nearly as large as that in August. Plenty of boats are available, but vessels are being delayed somewhat in unloading cargoes. Everything now points to a very heavy movement until the close of navigation. Prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; Old Range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

Pig Iron.—The demand for foundry iron continues very active. A large number of consumers have inquiries out for lots ranging from 200 to 1000 tons for first quarter and first half delivery, and there is a general disposition among the smaller melters to cover for at least a portion of their requirements of the first part of next year. There is little inquiry for last quarter iron. Prices are firmer for delivery during the balance of the year, and some of the furnace interests are advancing their quotations for delivery during the first half. One Cleveland furnace has advanced its asking price for No. 2 for the first half to \$17.50, at furnace, and \$17 is quoted here as the minimum for delivery after January 1. Small sales have been sold at the latter price. In the Valley No. 2 foundry is quoted at \$16.50 for the first half and quarter, but one furnace has been shading this to \$16.25. A leading local interest reports the sale of five lots of No. 2 foundry iron, aggregating 15,000 tons, for shipment from Detroit during the first half at \$17.50, at furnace. This interest this week withdrew from the market temporarily and is now refusing to make quotations on any grade of iron. Another local interest that has remained out of the market for a short time expects to take on additional contracts in a few days. There is a good volume of inquiries for malleable iron from some important consumers, the largest being for 4000 tons. Among the foundry iron inquiries pending for first half delivery is one from a Michigan manufacturer for 2000 tons, one from Youngstown for 1500 tons, and several from northern Ohio for 500 tons and under. We note the sale of 800 tons of No. 2 Southern in this territory for first half delivery at \$13.75, Birmingham. The Cleveland Furnace Company expects to blow in its new stack next week. For the balance of the year we quote, delivered, Cleveland, as follows:

Bessemer	\$16.90
Northern foundry, No. 1	\$17.25 to 17.50
Northern foundry, No. 2	16.75 to 17.00
Northern foundry, No. 3	16.25 to 16.50
Southern foundry, No. 2	17.85
Gray forge	15.50 to 15.75
Jackson County silvery, 8 per cent, silicon	20.05

Coke.—Several furnace interests are in the market for their requirements for the first half, but many producers are as yet unwilling to quote prices. One local furnace interest has contracted with an affiliated company for its supply,

about 6000 tons per month, for the first half. Inquiries for the balance of the year are plentiful. The scarcity of labor continues in the coke region and shipments are being delayed. We quote standard Connellsville furnace coke at \$2 to \$2.25 per net ton, at oven, for prompt shipment and balance of the year. Standard makes of 72-hr. foundry coke are held at \$2.25 to \$2.40 for the balance of the year. For the first half producers are now asking as high as \$3.

Finished Iron and Steel.—The Carnegie Steel Company has received a contract from the American Shipbuilding Company for 14,000 tons of plates and shapes for four lake freight boats, to be built for blast furnace interests, orders for which were placed during the week. The boats will be completed in time for the opening of navigation next season. General conditions in the trade continue very active. There is a heavy volume of specifications on contracts and some of the large consumers are becoming anxious to cover for their requirements of the first part of next year. In steel bars two inquiries aggregating 25,000 to 30,000 tons are pending, for delivery until July 1. Some of the structural shops are figuring on work for early next year and are anxious to make contracts for shapes and plates in order to have a basis on which to make their bids. We note the closing of one contract for 2000 tons of plates and shapes for delivery during the first quarter at 1.50c., Pittsburgh. Some steel bar tonnage has been taken under contract at 1.40c., Pittsburgh, for the first quarter. Mills, however, are not seeking orders for delivery after January 1 and some are still refusing to make such contracts. The leading interest has advanced its price on steel bars to 1.40c., Pittsburgh, and for small lots for quick shipment mills are getting 1.45c., Pittsburgh. The demand for plates continues heavy. Some of the boiler and tank shops have used more than they expected to, have taken all in on their contracts and are now in the market for additional supplies. Iron bars are firm at 1.45c. to 1.50c., Cleveland. Both of the local mills are filled up for eight weeks on large sizes, owing to the receipt of good sized orders from the car companies, but the demand for small sizes is light. The contract for an addition to the Hollenden Hotel, Cleveland, requiring about 800 tons of steel, has been awarded to T. H. Brooks & Co., Cleveland. Among other structural work that has come out is a rolling lift bridge to be built by the Baltimore & Ohio Railroad in this city, the contract for which has been let to the Pennsylvania Steel Company. It will require about 500 tons.

Old Material.—The market is more active than for some time. Local mills are buying quite freely, but only in rather small lots, inquiries for round tonnages being lacking. Prices are very firm, and an advance of 50c. a ton is noted in heavy melting steel scrap and several other grades. As a result of the advance in price of pig iron, there is a good demand from the foundries for cast scrap. Dealers expect that prices will go still higher soon, and hence the present quotations are bringing out very little scrap from the yard stocks that have been held for some time with this in view. Railroad lists offered last week brought high prices. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	\$16.00 to \$16.50
Old iron rails	18.00 to 18.50
Steel car axles	19.00 to 19.50
Old car wheels	16.00 to 16.50
Heavy melting steel	15.50 to 16.00
Relaying rails, 50 lb. and over	21.50 to 22.50
Agricultural malleable	14.00 to 14.50
Railroad malleable	16.00 to 16.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	\$20.00 to \$20.50
Cast borings	8.00 to 8.50
Iron and steel turnings and drillings	10.00 to 10.50
Steel axle turnings	11.50 to 12.00
No. 1 busheling	13.50 to 14.00
No. 1 railroad wrought	15.00 to 15.50
No. 1 cast	14.00 to 14.50
Stove plate	12.00 to 12.50
Bundled tin scrap	10.50 to 11.00

The Burt Mfg. Company, Akron, Ohio, states that the month of August was the largest in its history, which extends over a period of 17 years. The fact that the unfilled orders on the company's books amount to nearly 40 per cent. of its entire output for August is an indication of the wonderful improvement which has taken place in business during the last few months. This is certainly a remarkable showing, taking into consideration that many lines are not as yet up to their normal condition.

The new torpedo boat destroyer Flusser, built by the Bath Iron Works, Bath, Maine, on its standardization trial September 1 attained a speed of 33.7 knots for 1 hr., the average of its five top-speed runs being 32.7 knots. It is stated that this establishes a record three knots faster than thus far made by any other vessel in the United States Navy.

New York.

NEW YORK, September 8, 1909.

Pig Iron.—The lower grades of foundry iron are relatively scarce, and command prices for prompt delivery closer to those of the higher grades than usual. There has been a fair degree of activity in foundry irons, but no specially interesting transactions are reported. Some back log orders are being taken for next year, but many sellers are asking prices which virtually put them out of the market. The cable report of a sale of 40,000 tons of German "steel making iron" to this country, cannot be confirmed here. Probably spiegeleisen is meant, which has been translated in the manner referred to. This would not be a transaction significant of any export movement of pig iron for ordinary purposes from Germany. We quote Northern No. 1 foundry, \$18.50 to \$19; No. 2 foundry, \$18 to \$18.50, and No. 2 plain, \$17.50 to \$18, tidewater, for delivery during 1909 and the first quarter of 1910. Alabama iron is quoted on the basis of \$18 to \$18.25 for No. 2 foundry, New York.

Ferroalloys.—More ferromanganese has been sold during the last month than in any equal period in the history of the trade. While it would be difficult to estimate just how much has changed hands, it is safe to say that it was considerably above 10,000 tons, and the indications are that there will soon be a sharp advance in prices. At present it would be hard to buy ferromanganese delivered in New York for less than \$44 for this year's delivery and \$45 for next year's delivery. Ferrosilicon is plentiful, and the demand is so light that it is hard to establish a market price. Some sales have been reported at \$64, New York, but that is a low figure, and it is certain that some sellers would not take that price. As a rule, \$65 is being quoted.

Steel Rails.—Some additional sales have been made in the South, as well as in the Chicago District. Included in the latter amounts is an order from a frog and switch company for 20,000 tons. Several lots for 1910 are understood to be under negotiation. The Northern Pacific has bought additional rails for this year's shipment, and the Great Northern is in the market for 1910 rails.

Structural Material.—The amount of new business in sight is not sufficient to indicate the maintenance in September of the rate of the past six months. In New York City no large work is pending, though there has been for some time a steady stream of apartment house contracts, this business being widely distributed. Two recent lettings, requiring 900 tons of steel each, are the Carlyle Realty Company Building, taken by the A. E. Norton Company, and the Chickering & Walker apartment, for which the Hinkle Iron Works has the fabricating contract. Following a large amount of new construction by New England textile interests in the past year, comes the contract for the Nonquitt Company's spinning mill at New Bedford, Mass., calling for about 1100 tons, and Bethlehem shapes will be used. The Bethlehem Steel Company will also furnish the steel for the Old National Bank at Spokane, Wash., the fabricating contract going to the Minneapolis Steel & Machinery Company. For the Cape Cod Canal, four rolling lift bridges will be built, and bids are to be opened on Friday of this week. The railroads are doing comparatively little buying at the moment, the latest business of consequence in the West being that taken by the American Bridge Company, 8000 tons of bridges in all, for the Atchison, Chicago & Northwestern and Burlington lines. The West shows more activity in general building than the East. There are evidences in the East of the cumulative effect of Chicago basing prices on structural shapes and plates. Mills formerly able to ship into the Chicago District are now restricted to farther Eastern territory and competition is keen. In some cases prices made on fabricating contracts in the East have been but little above current prices in territory close to Pittsburgh. We continue to quote plain material delivered at tidewater at 1.56c., when shipped from mill. Some mills are quoting 1.61c., New York.

Bars.—The demand for bar iron appears to have fallen off to some extent, reports of sales not being quite so numerous. Eastern manufacturers quote 1.55c., tidewater, on ordinary bar iron and 1.60c. to 1.65c. tidewater, on refined and test bars. Steel bars are firmly held at 1.56c. to 1.61c., tidewater.

Cast Iron Pipe.—The usual autumn demand for small quantities continues and is quite active. New York City will buy from 1000 to 1500 tons next week. Inquiries for spring delivery are becoming more frequent and occasionally an order of this character is placed on which manufacturers are quoting prices somewhat in advance of those named for this year's delivery. It is noteworthy that among those who are anticipating their spring requirements are to be found, as usual, some of the shrewdest buyers who are undoubtedly of the belief that lower prices can now be secured than by waiting until some time in the winter. Manufacturers are maintaining a much stronger attitude and while \$24 to \$24.50 represents the market, some name \$25.50 per net ton, tidewater, as their bottom rate for carload lots of 6-in.

Old Material.—While the market apparently maintains

its strength, it is remarked that holders of old material who have for some time been disinclined to part with their stocks, believing that much higher prices would prevail, are now more disposed to realize and have been making quite a number of sales at current prices. This is observed in heavy melting steel scrap as well as in other classes of material. Some dealers are now strongly of the opinion that values have attained their high point for the present and that lower rates are to be expected in the near future. It is asserted, however, that the steel works in eastern Pennsylvania are not oversupplied with steel scrap and that purchases of considerable quantities will have to be made to meet early requirements. The railroad lists which have come out within the past week have presented fairly large quantities, but those which have so far been closed have realized prices slightly above the level of those recently prevailing. The strongest demand has been experienced for old car wheels, cast borings and wrought turnings. Iron and steel axles are scarce. Quotations are as follows, per gross ton, New York and vicinity:

Rerolling rails.....	\$16.00 to \$16.50
Old girder and T rails for melting.....	15.00 to 15.50
Heavy melting steel scrap.....	15.00 to 15.50
Relaying rails.....	23.00 to 24.00
Standard hammered iron car axles.....	22.50 to 23.00
Old steel car axles.....	20.00 to 20.50
No. 1 railroad wrought.....	17.00 to 17.50
Iron track scrap.....	15.00 to 15.50
No. 1 yard wrought, long.....	15.00 to 15.50
No. 1 yard wrought, short.....	14.00 to 14.50
Light iron.....	9.50 to 10.00
Cast borings.....	9.50 to 10.00
Wrought turnings.....	11.50 to 12.00
Wrought pipe.....	14.00 to 14.50
Old car wheels.....	15.50 to 16.00
No. 1 heavy cast, broken up.....	14.50 to 15.00
Stove plate.....	12.50 to 13.00
Locomotive grate bars.....	12.50 to 13.00
Malleable cast.....	15.50 to 16.00

Iron and Industrial Stocks.

NEW YORK, September 8, 1909.

For a week badly broken by holidays, the period which has elapsed since our last report has shown remarkable strength with some striking advances. United States Steel common again made a fresh high record, selling up to 80 $\frac{1}{4}$ on Friday. Other steel stocks and the equipment stocks sympathized with this movement, which was attributed to the glowing reports of the condition of the iron and steel trade and the evidences of increasing demand from the railroads. No exchanges were open on Saturday and Monday. The market on Tuesday was unfavorably affected by the reported illness of Mr. Harriman, but this did not so seriously disturb the industrial stocks as some of the stocks of railroads in which he is deeply interested. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.. 15 - 15 $\frac{1}{4}$	Railway Spr., com. 49 - 50 $\frac{1}{4}$
Allis-Chalm., pref..... 53	Railway Spr., pref..... 108
Beth. Steel, com... 32 - 35 $\frac{1}{4}$	Republic, com..... 37 $\frac{1}{2}$ - 39 $\frac{1}{4}$
Beth. Steel, pref... 66 - 68	Republic, pref..... 105 $\frac{1}{2}$ - 106 $\frac{1}{2}$
Can, com..... 12 - 12 $\frac{1}{2}$	South. I. & S., com. 19 - 20 $\frac{1}{2}$
Can, pref..... 83 - 83 $\frac{1}{2}$	South. I. & S., pref. 54 - 56 $\frac{1}{2}$
Car & Fdry, com... 67 $\frac{1}{2}$ - 68 $\frac{1}{2}$	Sloss, com..... 84 $\frac{1}{2}$ - 86 $\frac{1}{2}$
Car & Fdry, pref..... 120	Sloss, pref..... 119 $\frac{1}{2}$
Steel Foundries... 58 $\frac{1}{2}$ - 59 $\frac{1}{2}$	Pipe, com..... 32 - 33 $\frac{1}{2}$
Colorado Fuel.... 44 $\frac{1}{2}$ - 45 $\frac{1}{2}$	Pipe, pref..... 85
General Electric. 165 $\frac{1}{2}$ - 167 $\frac{1}{2}$	U. S. Steel, com... 77 $\frac{1}{2}$ - 80 $\frac{1}{4}$
Gr. N. ore cert... 81 $\frac{1}{2}$ - 83 $\frac{1}{2}$	U. S. Steel, pref... 126 - 128 $\frac{1}{2}$
Int. Harv., com... 88 - 88 $\frac{1}{2}$	Westinghouse Elec. 85 - 86 $\frac{1}{2}$
Int. Harv., pref... 119 $\frac{1}{2}$ - 120 $\frac{1}{2}$	Chl. Pneu. Tool... 31 $\frac{1}{2}$ - 32 $\frac{1}{2}$
Int. Pump, com... 47 $\frac{1}{2}$ - 48 $\frac{1}{2}$	Am. Ship, pref..... 110 $\frac{1}{2}$
Int. Pump, pref... 88 $\frac{1}{2}$ - 89 $\frac{1}{2}$	Cambria Steel.... 43 $\frac{1}{2}$ - 45
Locomotive, com... 58 $\frac{1}{2}$ - 60	Lake Sup. Corp... 27 $\frac{1}{2}$ - 27 $\frac{1}{2}$
Locomotive, pref... 115 - 115 $\frac{1}{2}$	Penn. Steel, pref... 116 - 116 $\frac{1}{2}$
Nat. En. & St., com. 19 - 20	Warwick..... 9 $\frac{1}{2}$ - 9 $\frac{1}{2}$
Nat. En. & St., pref... 99 $\frac{1}{2}$	Crucible St., com... 13 $\frac{1}{2}$ - 14
Pressed Steel, com. 49 $\frac{1}{2}$ - 51	Crucible St., pref... 81 - 82 $\frac{1}{2}$
Pressed Steel, pref. 102 $\frac{1}{2}$ - 108	Harb.-W. Ref., com. 30 - 31

* Ex dividend.

Last transactions up to 1.30 p.m. to-day are reported at the following prices by S. B. Chapin & Co., 111 Broadway, New York: United States Steel common 78 $\frac{1}{4}$, preferred 125 $\frac{1}{4}$, bonds 106 $\frac{1}{2}$; Car & Foundry common 67 $\frac{1}{2}$, preferred 120; Locomotive common 58, preferred 115; Steel Foundries 57; Colorado Fuel 43 $\frac{1}{2}$; Pressed Steel common 50, preferred 108; Railway Spring common 49 $\frac{1}{2}$; Republic common 37 $\frac{1}{2}$, preferred 105; Sloss-Sheffield common 85; Cast Iron Pipe common 32, preferred 84 $\frac{1}{2}$; Can common 12 $\frac{1}{2}$, preferred 82 $\frac{1}{2}$.

Chisholm & Chapman, 18 Wall Street, New York, furnish the following quotations:

Iron and Steel Bonds.

	Bid.	Asked
Bethlehem Steel 1st ext. 5s, due January, 1926.....	88	88 $\frac{1}{2}$
Bethlehem Steel purchase money 6s, August, 1908.....	117	117
Buffalo Iron 5s, October, 1925.....	95	100
Buffalo & Susquehanna Iron 1st 5s, June, 1932.....	99 $\frac{1}{2}$	99 $\frac{1}{2}$
Buffalo & Susquehanna Iron deb. 5s, January, 1926.....	94	94
Domillon Iron & Steel 5s, July, 1929.....	97	97
La Belle Iron 1st 6s, December, 1923.....	104 $\frac{1}{2}$	104 $\frac{1}{2}$
Lackawanna Steel 1st 5s, April, 1923.....	98 $\frac{1}{2}$	98 $\frac{1}{2}$
Maryland Steel 1st 5s, February, 1922.....	102	103
Pennsylvania Steel 1st 5s, November, 1917.....	102	103

Pennsylvania & Maryland Steel 6s, September, 1925 ..	110 1/2
Republic Iron & Steel 1st 5s, October, 1934	102 7/8
Sloss Iron & Steel 1st 6s, February, 1920	109
Sloss Iron & Steel consol. 4 1/8s, April, 1918	97
Jones & Laughlin 1st 5s, May, 1939	102 7/8

United States Steel Corporation.

Collateral Trust 5s, Series A, C, E, April, 1951	114 3/4	115 1/4
Collateral Trust 5s, Series B, D, F, April, 1951	114 3/4	115 1/4
Sinking Fund 5s, April, 1963	107	107 1/4
Union Steel 1st 5s, December, 1952	105	105 3/4
Clairton Steel 5s, 1908-1913	101	..
St. Clair Furnace 1st 5s, 1910-1930	101	..
St. Clair Steel 1st 5s, 1908-1926	101	..
Illinois Steel deb. 5s, January, 1910	100	..
Illinois Steel 5s, April, 1913	100 1/4	..

All bonds quoted "and interest."

Dividends.—The Dominion Iron & Steel Company, in addition to the regular semiannual dividend of 3 1/2 per cent., has declared a dividend of a similar amount against the accumulated deferred dividends on its preferred stock. There is still 28 per cent. due to stockholders.

The American Car & Foundry Company has declared a quarterly dividend of 1 1/4 per cent. on the preferred stock and 1/2 per cent. on the common stock, both payable October 1.

The Canadian Westinghouse Company, Ltd., has declared the regular quarterly dividend of 1 1/2 per cent., payable October 11.

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, has paid a quarterly dividend of 1 1/2 per cent.

Metal Market.

NEW YORK, September 8, 1909.

Copper.—Resales of more than 1,000,000 lb. of lake copper of two certain brands at considerably less than 13c. caused something of a flurry in the market during the last few days, but, although those who took the metal up are offering it at 13c. a pound, that does not make the market price. The only lake copper that can be bought at 13c. is a limited quantity of the brands in question, and while there is talk of sales of lake copper at 13.25c. about 13.50c. is the prevailing price, and, as a matter of fact, a transaction was made to-day for a good sized lot at that figure. A careful canvass of the trade shows that while the market is dull, the more important sellers are holding firm at the price we quote, and it is the general belief that the coming report of the Producers' Association, which will be announced September 10, will show that stocks have not increased to a great extent. Some people who are close to the affairs of the Producers' Association predict a report of a decrease in stocks, and this will undoubtedly tend to strengthen the situation. Electrolytic copper has gone off, and it can be had for 13.12 1/2c., delivered in the Naugatuck Valley in 30 days. The London market is listless, and to-day spot copper brought £59 1s. 3d., and futures £59 18s. 9d. The exports of copper are very light this month, which is taken as an encouraging sign by the trade in general, as it is predicted that with a depletion of stocks abroad better prices will be established. So far this month 13,419 tons of copper have been shipped abroad.

Pig Tin.—In spite of the fact that the tin trade here is feeling the pressure of a decided bear movement in London, where sales have been made at a low figure, the trade is cheerful and there has been a fair amount of selling. The monthly statistics for August, which were reported in these columns last week, are considered favorable, and the fact that some business was done last Saturday in anticipation that the London market would go higher is taken as a sign that consumers here are anxious to buy. As a rule there is no trading here on Saturdays, but with the impending holiday on Monday some consumers bought, fearing that there would be an advance abroad. This resulted in establishing the high price for the week on that day, but unfortunately for the buyers, their estimate of the situation proved incorrect, as the market fell off sharply again on Tuesday, as the following prices for the week will show:

	Cents.
September 1	30.20
September 2	30.30
September 3	30.35
September 4	30.40
September 7	30.10
September 8	29.95

Yesterday there was a sale of 25 tons of tin on the floor of the Metal Exchange at 30.10c., and other outside sales at the same figure, which established the day's prices, but some sellers got slightly above that figure. In London to-day spot tin was sold at £135 17s. 6d. and futures at £137 2s. 6d. The arrivals of tin so far this month have been 685 tons and there are 2306 tons afloat.

Lead.—The market has steadied, but there is little buying. Sales of lead on the Metal Exchange floor have fallen off and the price of the American Smelting & Refining Company is being held firm at 4.40c., while some outside sellers are demanding 4.45c. The London market is slightly stronger than last week and lead there is bringing about 1s. more than at the time of our last report, the price there being £12 13s. 9d.

Tin Plates.—With the majority of independent mills running on full time against a rather light demand, the looked for advance in the price of tin plates has not materialized, and as the canners will not be in the market for material for at least four months the continued inactivity may serve to keep present prices steady. We quote \$3.64 per box for 100-lb. IC coke plates, while in some cases a premium is being obtained for early delivery.

Spelter.—Reports of sales of spelter at 5.75c., New York, are not substantiated by the experience of some buyers who have shopped about considerably to get it at that price, and it seems assured that the market is firm at 5.85c., regardless of the fact that the demand is not heavy. It St. Louis spelter is bringing 5.70c. Zinc ores are advancing, and the galvanized sheet interests are doing a big business, so that all things point toward still higher prices for spelter.

Antimony.—There seems to be some difference of opinion as to the price of antimony and it is evident that before long there will be a general readjustment. There is plenty of it on hand and some outsiders are said to be quoting low figures. The usual price at present is 8.37 1/2c. for Hallett's and 8.62 1/2c. for Cookson's, which is an advance over the prevailing prices of last week. Outside brands are plentiful and might easily be obtained at 7.25c.

Old Metals.—The following dealers' selling prices represent the New York market:

	Cents.
Copper, heavy cut and crucible	12.75 to 13.00
Copper, heavy and wire	12.25 to 12.50
Copper, light and bottoms	11.50 to 11.75
Brass, heavy	9.00 to 9.25
Brass, light	7.25 to 7.50
Heavy machine composition	11.75 to 12.00
Clean brass turnings	8.25 to 8.50
Composition turnings	9.50 to 9.75
Lead, heavy	4.20 to 4.25
Lead, light	3.90 to 3.95
Zinc scrap	4.15 to 4.25

The Standard Steel Car Company Buys the Middletown Car Plant.—Officers of the Standard Steel Car Company, Pittsburgh, are now in the East completing arrangements for the taking over of the plant of the Middletown Car Company, Middletown, Pa. The Standard Steel Car Company contemplates the rearranging of the machinery at Middletown for the building of steel cars as carried on at its other plants. The new works will have a capacity of about 20 steel cars per day. This acquisition gives the company control of four plants, which are located at Butler, New Castle and Middletown, Pa., and Hammond, Ind., having a total capacity of about 250 steel cars per day.

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, has won a signal victory in its contention for the contract for the valves in the high pressure water line at San Francisco, and the Board of Public Works of that city will readvertise for new bids on the work. The company has secured the contract for the by-pass connections for a high pressure gas line from the West Virginia fields to Cincinnati.

Mackintosh, Hemphill & Co., Pittsburgh, have received an order from the Forged Steel Wheel Company, Butler, Pa., for a twin direct reversing engine with cylinders 55-in. in diameter and 60-in. stroke. It will drive the new universal two-high slabbing mill, which is also to be built by the former for the open hearth steel plant being erected by the latter at Butler, Pa.

Employees of the open hearth department of the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio, are now being paid a special tonnage rate, instead of by the day. This has been in order since September 1. The entire department, comprising 12 50-ton open hearth furnaces, is being operated to its extreme capacity.

The Republic Iron & Steel Company made a new record in August at its Bessemer plant at Youngstown, Ohio, 55,114 gross tons of blooms, billets and sheet bars being rolled. The best previous month's performance was 50,690 tons.

President Plummer of the Dominion Iron & Steel Company, Sydney, Nova Scotia, says that the demand for the company's product is beyond its capacity, and that extensions of the plant are being pushed as rapidly as possible.

Birmingham.

BIRMINGHAM, ALA., September 6, 1909.

Pig Iron.—Aside from the fact that numerous inquiries have flooded the market, an aggregate of something like 5000 to 7000 tons was booked during the past week. One of the big industrial interests is known to have made inquiry for 15,000 to 25,000 tons of iron for delivery during the remainder of this year and the first quarter of next year, but a firm offer of \$13.50 per ton at the furnace was flatly refused. Since last week's report the price of \$14 for No. 2 foundry basis, has crystalized, either for prompt shipment or for the first quarter of 1910. Some sellers prefer to "steer clear" of any business at all for next year, preferring to wait for more settled conditions as to the market, as well as letting matters adjust themselves properly to meet the situation. Stocks of iron on the yards have not increased materially, though several furnaces have been blown in recently. A total of 30,000 tons, outside of the speculators' iron piled on the yards, is considered a conservative estimate of the available tonnage. Low grades continue to be in demand, and in some cases bring a premium over the base price. With improved conditions in railroad circles comes a healthier tone in the charcoal iron market; and to-day prices are stiff at \$20.50 to \$21, at the furnace.

Cast Iron Pipe.—Manufacturers report running full time and sufficient orders in hand to take care of their output for some little time to come. Business coming up for consideration continues to be in comparatively small lots. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., \$26; 8 to 12 in., \$25; over 12-in., average \$24, with \$1 per ton extra for gas pipe.

Old Material.—While there is no considerable stock of scrap on the yards, dealers continue to buy. Wherever practicable they fill certain specifications by car lot shipments from point where it is bought, thereby doing a bulk business "on the wing," and piling on the yard only such scrap as has to be assembled for carload specifications. Heavy steel scrap continues in demand. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron rails.....	\$15.00 to \$15.50
Old iron axles.....	15.50 to 16.00
Old steel axles.....	12.50 to 13.00
No. 1 railroad wrought.....	13.00 to 13.50
No. 2 railroad wrought.....	11.00 to 11.50
No. 1 country wrought.....	10.00 to 10.50
No. 2 country wrought.....	9.50 to 10.00
No. 1 machinery.....	11.50 to 12.00
Tram car wheels.....	11.00 to 11.50
Standard car wheels.....	12.50 to 13.00
Light cast and stove plate.....	10.50 to 11.00
No. 1 steel.....	11.00 to 11.50
Cast borings.....	5.50 to 6.00

The American Sheet & Tin Plate Company's Operations.—On Wednesday morning of this week the American Sheet & Tin Plate Company had a total of 150 hot tin mills in operation out of 221 serviceable mills, and was also operating 145 hot sheet mills out of a total of 186 serviceable mills. In other words, 68 per cent. of the serviceable tin mill capacity and 80 per cent. of the serviceable sheet mill capacity were in full operation. In the tin plate plants 17 out of 28 mills at the American Works at Ellwood, Ind., were running. The National Works at Monessen, Pa., is on full with 25 mills. The New Castle Works, at New Castle, Pa., has 14 out of 20 mills running. The Shenango Works at New Castle has 15 out of 30 mills running. Other smaller tin plate plants owned by the company are being operated to full capacity.

The Iron & Steel Institute will meet in London September 27, 28, 29, 30 and October 1. The following papers are announced: "The Determination of the Power Consumption of Reversing Rolling Mills," by C. A. Ablett, London; "Comparative Tests of Cast Iron," by E. Adamson, Sheffield; "Artificial Magnetic Oxide of Iron," by F. J. R. Carulla, Derby; "Action of Air and Steam on Pure Iron" and "Corrosion of Iron," by J. Newton Friend, Darlington; "Uniform Moisture in Blast," by Greville Jones, Middlesbrough; "The Refining of Steel by Electricity," by Disponent E. J. Ljungberg, Falun, Sweden; "The Fuel Economy of Dry Blast, as Indicated by Calculations from Empirical Data," by R. S. Moore, London; "The 'Growth' of Cast Irons After Repeated Heatings," by Professor H. R. Rugan, Tulane University, New Orleans, La., and Dr. H. C. H. Carpenter, Manchester; "The Maintenance and Renewal of 'Permanent Way,'" by R. Price-Williams, London; "The Constitution of Carbon-Tungsten Steels," by T. Swinden, Sheffield.

General meetings will be held on Tuesday, Wednesday and Thursday at the Institution of Civil Engineers. The Carnegie medal will be awarded on Wednesday. The Duke of Devonshire is announced as the president-elect.

Internal Commerce During July.

A considerable increase in the industrial activity of the country is indicated by the July figures of leading internal commerce movements as reported by the Bureau of Statistics of the Department of Commerce and Labor. The industrial improvement is shown principally by the heavier movements of soft coal, coke, ore and iron products, and the increased building operations reported from the larger cities. Larger receipts of wool and heavier shipments of boots and shoes are further signs of returning business prosperity. The movements of grain, live stock and meats during the month were relatively light.

A heavy decline is noted in the July shipments of anthracite coal, the monthly total, 4,020,765 gross tons, being the lowest on record since May, 1906. The shipments of soft coal over eight of the leading Eastern coal carrying roads, 9,111,922 gross tons, on the other hand, show a heavy increase over the June movement. The July shipments of anthracite coal by water from the five principal Atlantic seaports, 923,017 gross tons, were about 20 per cent. below the 1908 figures, while the July shipments of soft coal, 2,161,914 gross tons, show a considerable increase over the corresponding 1908 figures. The shipments of bituminous coal during the month over Ohio railroads, 1,313,914 net tons, were slightly below the July, 1908, total.

The coke production in the Connellsville District for the five weeks ending July 31 is stated as 1,770,342 net tons, which is almost double the quantity produced during the corresponding weeks in 1908. The iron ore shipments from Lake Superior and Lake Michigan ports, 6,727,664 gross tons, were the largest monthly shipments ever reported to the bureau.

Returns from about 100 of the larger cities indicate an increased building activity in all parts of the country, the monthly value of building permits granted by municipal authorities aggregating \$81,302,891, as compared with \$74,379,782 during the preceding month and \$60,631,125 in July, 1908.

The July figures of cars handled by 35 car service associations and demurrage bureaus in various parts of the country, 2,605,832 cars, indicate an increased traffic activity on the railroads, being 16 per cent. in excess of the corresponding 1908 total. The number of cars handled during the seven months of the current year, 17,521,719, show an even larger increase over the corresponding figures of the preceding year.

Announcement was made September 1 that Dr. Frederick A. Cook, of Brooklyn, N. Y., the Arctic explorer, who had just returned to Northern Europe, had reported his discovery of the North Pole on April 21, 1908. This was followed September 6 by an announcement from Commander Robert E. Peary, by telegraph from Labrador, that he had reached the North Pole April 6, 1909.

The Jones & Laughlin Steel Company, Pittsburgh, has received a contract for about 7500 tons of plates and small shapes for the three new lake freighters to be built by the Great Lakes Engineering Works, Detroit, Mich.

The No. 3 furnace of the Sloss-Sheffield Steel & Iron Company will be ready to be blown in about the middle of this month, after having been thoroughly overhauled and put in first-class condition. This will put in operation every furnace of the company in Alabama.

All the different plants of the Westinghouse Electric & Mfg. Company, at East Pittsburgh, Pa., were working full time last week. This is the first time that has occurred since the company was taken out of the hands of the receivers and demonstrates emphatically the large volume of business on hand.

OBITUARY.

DAVID PYOTT, one of the members of the foundry and iron working firm of Holmes, Pyott & Co., Chicago, died September 3 at Mackinac Island, after a protracted illness, aged 80 years. Was born in Dundee, Scotland, and located in Chicago in 1854. The firm in whose establishment he played an important part was organized in the early sixties, and enjoyed the distinction of being the only one of its kind which survived the Chicago fire. He leaves a son, David A. Pyott, and a daughter.

J. WHITCOMB COTTON, president of the American Tube Works, Boston, died September 7 from apoplexy at Petersboro, N. H.

GEORGE L. FISCHER, Pittsburgh, former president of the Fischer Foundry & Machine Company, died September 5, aged 70 years. He was born in Germany and accompanied his parents to this country in 1852, the family locating in Pittsburgh. When a young man Mr. Fischer organized the Fischer & Wenzell Foundry Company at South Twenty-first and Mary streets. His junior partner sold out a few years after the formation of the firm and the company then became Fischer & Thomas, continuing as such until 1885, when Mr. Fischer became sole owner. His sons were associated with him in the foundry business and managed it after his retirement in 1901.

Welsh Tin Plate Makers and Canada's Market.

TORONTO, September 4, 1909.—In the British House of Commons about a fortnight ago the suspension of the Canadian antidumping duty on tin plate was the subject of a question put by a Welsh member, Llewelyn Williams, the representative of the Caermarthen District. He asked if the president of the Board of Trade was aware that the duty referred to, which came into operation in May, 1908, had proved of great benefit to the Welsh tin plate trade; that that duty had been absolutely withdrawn on the first of last month; that the effect of such withdrawal was detrimental to the Welsh trade, inasmuch as it enabled American manufacturers to dump their surplus stock in Canada at less than cost price; and if the president of the Board of Trade could see his way to approach the Canadian Government with a request that the duty be brought into effect again? This duty, Mr. Williams added, was not inconsistent with free trade, and it enabled British tin manufacturers to compete on fair terms with other tin plate manufacturers seeking business in the Canadian market. Speaking for the president of the Board of Trade, Mr. Tennant replied that, beyond knowing that the Canadian Government had recently suspended the duty in question, it had no information on the matter, but was causing inquiry to be made and would communicate the results to the member who put the question.

There can be but one outcome of such inquiry. The Canadian Government will simply call the British Government's attention to the subsection of the antidumping clause of the tariff act providing that upon articles not made in substantial quantities in Canada the antidumping duty may be suspended. As there is at present little or no tin plate being made in Canada, the Government is not straining its discretion in withholding the duty.

British tin plate makers were known to be not greatly opposed to the proposal made over and over again in this country, that a moderate general duty be put on tin plate. Such duty would be the net one for Great Britain's competitors in the tin plate trade, but only about two-thirds of it would hold against British tin plate makers, as these would get the benefit of the preferential tariff. Moreover, a general duty would almost insure the enforcement of the antidumping duty. Therefore, a moderate Canadian tariff rate on tin plate would probably be more favorable to British makers than absolutely free entry for all.

C. A. C. J.

The Keystone Steel Foundry Company, Avonmore, Pa., which has been actively operating its gray iron de-

partment, is making preparations to put the steel casting department in operation in September. The plant is equipped with a 10-ton open hearth furnace, an 8-ton cupola and a Tropenas converter, served by a 5-ton and a 10-ton crane. The company manufactures a general line of steel and iron castings, making a specialty of rolling mill and plate glass factory work. L. H. Brengener is general manager.

PERSONAL.

Charles C. Henderson has been appointed general manager of works of the Allegheny Steel Company, Pittsburgh, whose plants are at Brackenridge, Pa. This company recently took over the Reliance Tube Company, of which Mr. Henderson at that time was treasurer and general manager.

Nathan Fleischer, treasurer and director of the Blake & Knowles Steam Pump Works, the International Steam Pump Company, and director of the Power & Mining Machinery Company, has sailed for Europe, to be absent six weeks.

The Lucas Pump Company, Dayton, Ohio, announces that R. E. De Weese has resigned as the treasurer of that company, and John W. Good has been elected to fill the vacancy for the unexpired term. Mr. De Weese is taking a trip abroad. Mr. Good is a prominent local business man.

Frank Salomon, representative of the engineering staff of Alfred H. Schütte, Cologne, Germany, is on his way to the United States. Letters to him should be addressed in care of Alfred H. Schütte, West Street Building, New York City.

W. B. Schiller, president of the National Tube Company, is suffering from an accident while horseback riding, injuring his leg.

H. S. White, James W. Downer and John Duncan, each with the title of assistant general manager of sales of the National Tube Company, Frick Building, Pittsburgh, have resigned. John J. Kennedy, formerly credit manager of the company, has been made general manager of sales, and David H. Ramsbottom has been appointed assistant general manager of sales. G. E. Benson has been appointed credit manager, succeeding John J. Kennedy. All these resignations and appointments became effective September 4.

Frederick F. Fischer, formerly with the Fischer Foundry & Machine Company, Pittsburgh, has succeeded George Webb as Pittsburgh representative of the DuBois Iron Works, with offices in the Park Building. Mr. Webb has been transferred to New York.

W. Owen Davis, division freight agent of the American Steel & Wire Company, with headquarters at Pittsburgh, has been transferred to Chicago.

Frank C. Neale, president of the Kittanning Iron & Steel Mfg. Company, Kittanning, Pa., has sailed for Europe.

B. L. Lockwood has been made assistant chief engineer of the Pressed Steel Car Company, Pittsburgh. He was formerly mechanical engineer of the Big Four Railroad system at Indianapolis.

Judge Elbert H. Gary, chairman of the United States Steel Corporation, will arrive home from Europe about September 21.

Jay F. Hoover, who has been manager of the Cleveland office of the Nernst Lamp Company for the past five years, has been appointed special agent of the company, with headquarters in Pittsburgh. The Cleveland office is now in charge of J. B. Mitchell.

James H. Norris, for the past nine years business manager of the John F. Allen Riveting Machine Company, 370-372 Gerard avenue, New York City, resigned September 1. It is his intention to rest and travel for some time before making any definite connection.

Charles J. Caley has resigned as general manager of the Russell & Erwin Mfg. Company because of ill health. He is still a member of the board of directors and later it is expected will act in an advisory capacity.

The Machinery Trade.

NEW YORK, September 8, 1909.

The demand for machinery the past week was fairly active, notwithstanding the holiday and the absence for several days from their offices of heads of departments, leaving but two or three actual working days. No large business was expected nor was there any disappointment over the nonappearance in the market of the important interests. The business transacted the few days houses were open was of sufficient volume to cause no uneasiness, and the inquiries, while they covered principally single tools and small lots, were numerous enough to indicate an expanding tendency. The automobile industry continues to be an important factor in the market and some good sized orders are expected from that source within the next few days, when a large list, figured on some time ago, is expected to be definitely closed. Automobile builders in this territory have in course of construction, or plans ready for, a number of new plants and additions that will necessitate the purchase of a large aggregate of metal making machinery and some of them will probably ask bids on their mechanical requirements within the next month or two. The fall activity in the trade which has been looked for all summer is expected to develop shortly, now that the vacation period is about over and employers and employees are at their offices.

The J. H. Ladew Company, leather manufacturer, 325 Academy street, Newark, N. J., is obtaining bids on a large plant to be constructed on the banks of the Passaic River in Newark, adjoining the Plank road. The plant will cost about \$500,000, and it will consist of five separate brick structures, including a four-story manufacturing building, 70 x 800 ft.; one story structure, 50 x 80 ft.; storage building, 50 x 150 ft.; boiler and engine house, 60 x 100 ft., and a lime house, 20 x 30 ft.

The Baldwin Locomotive Works, Philadelphia, Pa., which has been making some rather extensive improvements to its plant, has been purchasing considerable machinery in this territory of late and some New York houses have reported fair sized orders.

The De Haven Mfg. Company, 50-54 Columbia Heights, Brooklyn, N. Y., manufacturer of iron box strips, bale ties, pail hooks, &c., is rebuilding its plant which was destroyed by fire last summer and will probably expend about \$25,000 in equipping the new building. The machinery will not be purchased until after January 1. The new factory and warehouse will be erected at a cost of \$75,000, exclusive of the new equipment.

Within the next few weeks the Selden Motor Vehicle Company, Rochester, N. Y., will probably be ready to ask bids on the machinery it will require for equipping its new plant. Bids are being received for the construction of the plant which will be erected at University avenue and Probert street and which will consist of a main building, two stories, 60 x 300 ft., with a wing one story, 100 x 136 ft. The building will be of brick, steel and concrete and will have a total floor space of 55,000 sq. ft.

The Central of Georgia Railroad recently awarded contracts for the erection of additional shops, including a wood-working shop, 80 x 200 ft., and a blacksmith shop, 100 x 350 ft., both of steel and concrete construction. It is understood that bids will shortly be asked for the erection of boiler and tank shop. These shops are to be erected at Macon, Ga., where the road is erecting a plant to cost over \$1,000,000 and for the equipment of part of which considerable machinery was recently purchased. It is believed that quite a little in addition to that on the list recently closed will be bought to complete the equipment of these shops.

A general line of machinery for the manufacture of fiber trunks will be installed by William Bal, Inc., 285 New Jersey Railroad avenue, Newark, N. J., who has plans in preparation for a new plant to be erected at 8-14 Johnson street, Newark.

The Somerville Iron Works, Somerville, N. J., is building a new foundry and has inquiries out in this territory for its equipment.

Large Canadian Power Development.

Plans are being prepared by J. G. White & Co., 49 Exchange place, New York, for a power project that will entail the purchasing of a large amount of machinery, and it is expected that before long the trade will hear of inquiries for it. This is an enterprise of the Canadian Light & Power Company of Montreal, to construct a hydroelectric plant on the St. Lawrence River near St. Timothee, Quebec, and it has been in contemplation for some time. The engineers who have now received word to go ahead with their work are arranging for the building of a plant to develop 21,600 hp., and they are advised to plan with the idea of future developments. A canal known as the Beauharnois Canal, which passes around the rapids in the St. Lawrence at Grand Isle,

will be utilized for developing the power, as the Canadian Light & Power Company has obtained the right from the Government to adapt the canal to its uses. Near St. Timothee the canal passes within 200 ft. of the river bluff, and the power station will be located at that point. The work to be undertaken includes the construction of a canal intake and head gates, enlargement of the canal by extensive dredging operations, construction of a head wall 40 ft. high, a power station with 40 main units and two exciter units, an excavation sufficient for installation of 10 complete units, a transmission line to Montreal and a substation and distribution system in that city. The contract for the excavation work has not been let as yet, and it is understood that the matter of the machinery will not be arranged until that is attended to.

The Shaw Electric Company, Red Bank, N. J., has some inquiries out for power equipment for a good sized addition to its plant there.

D. G. Zeigler & Co., Jacksonville, Fla., have organized the Savannah Hydro-Electric Construction Company, with a capital stock of \$300,000, to construct water power electric plants in Georgia, Alabama, South Carolina and Florida. The new company will have its main office at Savannah, Ga.

The American Car & Foundry Company, Huntington, W. Va., has sent out an inquiry for a 375-hp. gas engine, vertical type preferred, with a speed of 175 to 225 rev. per min.; also a 220-volt direct current generator, to be direct connected to the engine.

The Thompson-Starret Company, Commonwealth Building, Pittsburgh, is taking estimates on two 175-hp. gas engines, direct connected with 110-kw. direct current generators and a switchboard, to be installed in the new building being erected on Sixth avenue, Pittsburgh, by the People's Natural Gas Company.

The Board of Water Supply, City of New York, will receive bids September 22 at its office, 299 Broadway, New York, for furnishing two 12,500,000-gal. steam turbo turbine pumps, two 225-hp. water tube boilers and all the necessary accessories for the Jerome avenue pumping station in the Borough of the Bronx, New York.

The Commissioner of Water Supply, Gas and Electricity, New York, will receive bids until September 15 for two pumping engines with foundations, steam and auxiliary piping and appurtenances for the Ninety-eighth street pumping station, Borough of Manhattan, and for pumping plants to be installed at Hook Creek, Horse Brook and the Baldwin pumping stations on Long Island.

On the tickler of an engineering corporation, centrally located, which makes a specialty of electric railroad construction, appear the names of the following traction systems which are planning new roads, extensions or power equipment:

Fort Wayne & Toledo Electric Railway Company, Harlan, Ind.; Missouri, Tennessee & Georgia Railway, Humbolt, Tenn.; Huntsville Railway & Light Company, Huntsville, Ala.; Hutchinson-Wichita Interurban Railway, Hutchinson, Kan.; Sioux City & Eastern Traction Company, Ida Grove, Iowa; Kanawha & Ohio Traction Company, Kanawha Falls, W. Va.; Chicago, Kankakee & Champaign Electric Railway, Kankakee, Ill.; Kansas City Southern Railway Company, Kansas City, Mo.; Manitou & Pike's Peak Railway Company, Manitou, Colo.; Marshall Traction Company, Marshall, Texas; Peninsular Railway Company, Mayfield, Cal.; Bellville & Mascoutah Traction Company, Mascoutah, Ill.; Memphis Street Railway Company, Memphis, Tenn.; Meriden Middletown & Gifford Railway Company, Meriden, Conn.; Meridian Light & Railway Company, Meridian, Miss.; Southern Light & Traction Company, Natchez, Miss.; New York, West Chester & Boston Railway Company, New York; Coos Bay, Oregon & Idaho Railway Company, North Bend, Ore.; Norwich, Colchester & Hartford Traction Company, Norwich, Conn.; Oklahoma City & Suburban Railway Company, Oklahoma City, Okla.; Omaha & Council Bluffs Street Railway Company, Omaha, Neb.; Oregon City, Beaver Creek & Mollalla Railway Company, Seattle, Wash.; Calro & Nashville Interurban Railway Company, Paris, Tenn.; Umatilla Railway & Electric Company, Pendleton, Ore.; Pittsburgh & Kansas City Railway Company, Pittsburgh, Kan.; Port Arthur Traction Company, Port Arthur, Texas; Arcoosook Valley Railroad Company, Presque Isle, Maine; Panhandle Electric Railway & Power Company, Priest River, Idaho; Kentucky Electric Railway Company, Providence, Ky.; St. Joseph Railway, Heat, Light & Power Company, St. Joseph, Mo.; Selma Street & Suburban Railway, Selma, Ala.; Sioux Falls Traction Company, Sioux Falls, S. D.; Chicago, South Bend & Northern Indiana Railway, South Bend, Ind.; Farwell Mountain Company, Steamboat Springs, Colo.; Superior Traction Company, Superior, Wis.; Rochester, Syracuse & Eastern Railway, Syracuse, N. Y.; Toledo, Bowling Green & Southern Railway, Toledo, Ohio; People's Railway, Wilmington, Del.; Johnstown & Gallitzin Railway Company, Johnstown, Pa.; Peoria & Galesburg Railway Company, Galesburg, Ill.; Walla Walla & Columbia Traction Company, Walla Walla, Wash.; Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa; Arkansas Valley Interurban Railway Company, Wichita, Kan.; Railway Terminal Company, Peoria, Ill.; Rapid Transit Company, Syracuse, N. Y.; Northern Texas Traction Company, Fort Worth, Texas; Georgetown Electric Railway Company, Georgetown, S. C.; New Hannibal & North Missouri Electric Railway, Kirksville, Mo.; Louisiana Light, Power & Traction Company, Louisiana, Mo.; Monterey & Del Monte Heights Railway, Monterey, Cal.; Central Pennsylvania Traction Company, Middletown, Pa.; Nashville Interurban Railway Company, Nashville, Tenn.; Pittsburgh & Kansas City Railway, Pittsburgh, Kan.; Oil Belt Traction Company, Oblong, Ill.; Oklahoma Midland Electric Railway Company, Dallas, Texas; Portland, Eugene & Eastern Railway, Portland, Ore.; Milwaukee Northern Railway, Port Washington, Wis.; Springfield, Beardstown & Quincy Interurban Railway, Petersburg, Ill.; Kentucky Electric Railway, Providence, Ky.; San Diego-Escondido Electric Railway Company, San Diego, Cal.; Independence, Soletz & Pacific Railway, Salem, Ore.; Boston & Northern and Old Colony Street Railway companies, Taunton, Mass.; Southern Colorado

Power & Railway Company, Trinidad, Colo.; Lexington Interurban Railway Company, Valley View, Ky.; Washington-Oregon Traction Company, Walla Walla, Wash.; American Street Railway Company, Altoona, Pa.; Waldo Street Railway, Belfast, Maine; Onio Valley Traction Company, Brockport, Ill.; Danville, Urbana & Champaign Company, Champaign, Ill.; Kenawha & Ohio Valley Traction Company, Charleston, W. Va.; Paris & Northern Railway, Chrisman, Ill.; Cienfuegos, Palmita & Cruces Electric Railway & Power Company, Cienfuegos, Cuba; Cleveland Traction Company, Cleveland, Ohio; Crook Creek Electric Light & Railway Company, Clinton, Tenn.; Kansas Union Traction Company, Coffeyville, Kan.; Columbus, Greensburg & Richmond Traction Company, Columbus, Ind.; Attawaugan Railway Company, Dayville, Conn.; Colorado Interurban Electric Railroad Company, Denver, Colo.; Detroit, Lansing & Grand Rapids Railway, Detroit, Mich.; Iowa Light & Traction Company, Eldora, Iowa; Elwood City & Wurttemberg Street Railway, Ellwood City, Pa.; Fort Wayne & Toledo Electric Railway Company, Fort Wayne, Ind.; Southern Traction Company, Fort Worth, Texas; Girard & Iola Electric Railway, Girard, Kan.

All of the above comprise roads that are in operation or have been regularly organized for construction purposes. Among their requirements, rails, track and overhead material of all kinds will be prominent. For a majority of the roads most of the material required for extensions or improvements has not yet been purchased.

Catalogues Wanted.—The recent flood at Monterey, Mexico, did about \$500,000 damage to the plant of the Cia Minera Fundidora y Afinadora, Monterey. Its power house was under 8 ft. of water, and the supply warehouse, with about \$100,000 worth of stock, was destroyed. J. Allan Smith, Aparpado 16, Monterey, chief engineer and purchasing agent for the company, desires catalogues from manufacturers of and dealers in mechanical and electrical supplies.

New England Machinery Market.

BOSTON, MASS., September 7, 1909.

Labor Day has made the usual wide break in the buying of machinery, as manufacturers, dealers and buyers enjoyed their holidays, but the week begins well, the first mails containing some good orders. August's business at least equaled that of July, when normally it should have been less, and September promises to be much better. No large lists are out so far as can be learned, but medium sized lots are being figured, and there is more store trade than during August. More manufacturing industries are going on long hours and night shifts are becoming more common, and would be employed in many more works were it not for the difficulty in securing a sufficiency of competent workmen.

Some of the machine tool builders have advanced their prices beyond what they were three years ago because they do not wish to fill up their books with orders at the present lists, and others are preparing to follow the example thus set. They have a keen perception that within a few months they should be in a position to make the most out of the market, which should be higher all along the line. Three years ago, when the resumption of buying on a large scale was first felt, many concerns took all the business they could get at the old figures. When prices generally went up it was months before these houses began to realize the increased profit. The few who raised their prices early saw for a time their competitors getting the lion's share of current business, with deliveries getting farther and farther away. But finally customers returned to those who could make early shipments and cheerfully paid the price. These concerns got the full benefit of each advance. Others have remembered the experience and propose to make no mistake in this respect. It is not at all unlikely that a general advance will follow the interchange of views which will accompany the meeting of the National Modern Tool Builders' Association later in the autumn.

The Roren Drop Forging Company, Providence, R. I., a new corporation, has taken the plant at East Providence formerly occupied by the Bullard Automatic Wrench Company, and will manufacture drop forgings. The company has a Rhode Island charter, in which the capital stock is named at \$100,000. The incorporators are Albert H. Roren, who will manage the business, William F. Martin and George H. Raymond, all of Providence.

There is disappointment that the New England bidder for one of the two 26,000 ton battleships, the Fore River Shipbuilding Company, seems to be out of the running. So large a contract for a local yard meant large purchases from Boston dealers. The equipment alone of the machine shop of such a warship as the specifications call for is no small order. It had been hoped that the alternate bid for indirect drive from steam turbine, through generators and motors, would prove sufficiently attractive to the Navy Department to cause its acceptance, but the result seems to be rather the adoption of this system on a smaller vessel as the initial experiment with a theoretically more economical motive power.

The Parker Motor Company, Hartford, Conn., has been organized with a Connecticut charter to manufacture motors for automobiles. Lewis D. Parker is the president and treasurer, G. T. McCue is vice-president and F. C. Billings

is secretary. The authorized capital stock is \$50,000. The company will occupy a portion of the factory of the Springfield Elevator & Pump Company, Windsor street, Hartford. A considerable amount of machinery has been purchased, and it is hoped to make deliveries in January.

The Corbin Screw Company, New Britain, Conn., is to erect an additional factory building. It will be of brick, 50 x 380 ft., with alternate bids for four and six stories. The power will be furnished from the present plant.

The Birmingham Iron Foundry, Derby, Conn., manufacturer of chilled and sand rolls, rubber mill and general heavy machinery and castings, is to make a large increase in its plant. An addition to the foundry will be 66 x 88 ft., of brick and steel, and will be used as a department for machine molding and light work, for which no new equipment will be needed, the company states. The company has also purchased the property of the Howe Mfg. Company, adjoining its works, including three brick and stone buildings, which will give 22,000 sq. ft. of floor space. Alterations are in progress to adapt the buildings to their new purposes. The two larger will be devoted to the pattern shop and fireproof pattern storage, and the basements to sand storage. The land adjoins the present foundry yard, which will be extended. A railroad switch into the yard will be put in this fall, and a Hunt track system is now being installed to serve the works from the cars.

The Standard Company, Torrington, Conn., manufacturer of spokes, nipples, needles, spark plugs, &c., is to erect an addition to its works for manufacturing purposes.

The Economy Mfg. Company, New Haven, Conn., manufacturer of decorative concrete stone, laundry tubs and bathtubs, has changed its name to the Economy Concrete Company. The company will erect a new plant at New Haven, to be occupied when the lease of the present quarters on Water street expires at the end of the year. The works will be located on Dixwell avenue and will consist of two factories, each 90 x 300 ft., of concrete. Power will be furnished by a local company, motor drive being employed. The site comprises 8 acres of land, to which a spur track will be laid from the New York, New Haven & Hartford Railroad. It is planned to employ 200 men in the works.

The Langelier Mfg. Company, Providence, R. I., has brought out a new swaging machine for heavy work. It will swage solid stock up to 2 in. and tubing up to 3 in., its special purpose being with tubing for use in automobiles. The machine will taper from 4 to 8 in. in length.

The Westfield Power Company, Westfield, Mass., will install in a new power house a 150-kw. set, consisting of an engine furnished by the Chandler & Taylor Engine Company, Indianapolis, and a generator from the Fort Wayne Electric Company. The company furnishes power to 20 manufacturing concerns, and the purpose of the new unit is to do away with many hundred feet of shafting and its heavy friction load. Bids for the necessary motors have been submitted.

The Worcester Cold Storage & Warehouse Company, Worcester, Mass., which manufactures artificial ice in connection with its business, will build an addition 100 x 100 ft., one story.

The equipment of the Corwin Mfg. Company, Peabody, Mass., manufacturer of leather working machinery, will be sold at auction. The machinery includes a considerable number of modern tools.

The Holyoke Water Power Company, Holyoke, Mass., will erect a new building which will be rented for manufacturing purposes. Plans are in process.

Milwaukee Machinery Market.

MILWAUKEE, WIS., September 7, 1909.

Although the close of navigation is still three months or more distant and will probably be later than usual this year, preparations are already in progress for handling next season's output of ore, as well as for the winter movement by rail. These preparations are visible here in specifications or orders received by Wisconsin manufacturers, contractors and labor agencies, covering the construction of wharves and dock structures, ore pockets, loading bridges, cranes, hoists, standard gauge ore cars, larries, dumpers, yard locomotives, frogs, switches and apparatus of all kinds used at transfer ports or stations. Simultaneously builders of steam shovels, winding engines, cages, skips, cables, air compressors, drills, crushers, power plants, electrical apparatus, pumps and other machinery used both in surface and deep mine workings are listing orders several months ahead, while from blast furnaces, steel works, rolling mills and fabricating plants of every description come contracts for new equipment. The last named originate mainly with the so-called "independent" interests and seldom include any large contracts; but in the aggregate the volume of this trade is very heavy, and the buying is of a steady character, which indicates almost continuous future business from the same

sources. As a Milwaukee manufacturer recently expressed it, "The smaller concerns are now finding capital with which to gradually bring their plants to the same state of efficiency that was maintained by the United States Steel Corporation and its chief competitors during the period of panic," as well as funds for numerous extensions referred to in recent issues of this paper.

A feature of the industrial situation, the significance of which will be at once recognized as an indication of general activity among machinery builders, is the strong demand now existing for bolts, nuts and washers. One company in this section which produces washers exclusively also reports having made good sized shipments recently to car building and repair shops operated by the larger Western railroad systems.

Statement is made here, without contradiction, that the International Harvester Company will erect a large addition to its Milwaukee works on a site 300 x 1000 ft. recently acquired. The present heavy production of gasoline engines, referred to in this report some weeks ago, necessitates increased capacity here, as the old Milwaukee harvester works are now principally devoted to that branch of the business. Of late it has been found necessary to purchase a large percentage of the castings from custom foundries.

The requirements of the Koehring Machine Company, Milwaukee, for its new machine shop include a 66-in. boring mill, 30-in. planer and other tools, also 50-kw. engine driven generating set and a line of small motors for both individual and group drives.

The Mueller Motor Car Company, Milwaukee, has been incorporated by H. C. Mueller and others, \$20,000 capital, to engage in the manufacture of automobiles.

From Superior, Wis., it is reported that ore dock No. 2 at Allouez, which is 2100 ft. long and has 350 pockets, will be largely reconstructed at the close of navigation.

There is a strong probability that the Winona Launch & Engine Works will establish a new plant in La Crosse, Wis.

The Smith Machine Company, Milwaukee, Wis., will build a large addition to its principal machine shop. Considerable new equipment is needed.

A pattern storage building is to be constructed by the Wisconsin Foundry Company, Milwaukee, Wis.

Producer gas plant and engine, motors, shafting, belting, &c., will be required by the Constantine Mfg. Company for the new factory which it has decided to build at Madison, Wis. A blower for dust collecting system will also be installed.

A hydro-electric power plant is to be built on the Escanaba River to furnish current for a new interurban railway which the Escanaba (Mich.) Traction Company will construct between that city and Gladstone on the upper peninsula.

A battery of boilers, power and electrical machinery will be purchased by the H. W. Johns-Manville Company, Milwaukee, for the third plant now being erected there by that company.

Cleveland Machinery Market.

CLEVELAND, OHIO, September 7, 1909.

The automobile plants in this city and Michigan have been heavy buyers of machine tools during the past two months, several automobile builders placing orders for a large amount of equipment for the purpose of materially increasing their output for the coming season. This business together with the improved demand from other sources made the sales of some of the local machinery houses during August the largest in their history. So far this month the demand has not been quite as active as during the past few weeks, but dealers are looking for a good volume of orders, although they do not expect business to be as brisk as during August. It is believed that the heavy buying by the automobile plants is over for this season, but a fair volume of small orders is expected from this source every month. The tools most in demand are lathes and milling machines. Dealers' stocks of small sized lathes have become rather low and some of the builders are 30 days or more behind on deliveries. In view of the present condition of the market and the possibility of delayed deliveries buyers in some cases are anticipating their requirements and placing orders for machine tools for delivery near the close of the year. Deliveries are also somewhat slow on boring mills, for which there has been a good demand recently from the large makers of automobile tires in Akron, several of whom are enlarging the capacity of their plants.

Local machine tool builders all report a good volume of orders and plants are now being operated at practically full capacity. All kinds of skilled labor are scarce and some plants would increase their present working forces if they were able to secure workmen. The demand for automatic machinery continues heavy and builders have enough orders to keep their plants running full for some time. A good volume of orders for automatics has come recently from

makers of motorcycles. Railroads are buying machine tools more freely than they have been, and local builders report that their foreign business is slowly improving.

The supply of second-hand machine tools, which has been rather light for the past few months, has now become quite plentiful owing to the fact that some of the automobile makers have been throwing out some of their old tools and replacing them with new ones. The demand is not very active.

The Cleveland Machine & Mfg. Company is nearly doubling the capacity of its plant by the erection of a two-story brick addition, 150 x 200 ft. The additional equipment needed has been contracted for with the exception of a 25-ton electric crane. This company reports that it now has more work on hand than at any time before in its history, its product being mainly rolling mill machinery. Among orders recently received is one from the Pittsburgh Steel Company for a 24-in. tube mill.

The Ohio State Boiler Company, Lorain, Ohio, has been formed to manufacture a new boiler that will soon be placed on the market. The officers are: H. O. Wurmser, president and general manager; W. A. Bonsor, vice-president; H. L. Worden, secretary and treasurer. The officers, with Harry Baxter, F. A. Burgett, John Schonberger and Dr. E. V. Hug, comprise the Board of Directors.

The Transue & Williams Company, Alliance, Ohio, maker of drop forgings, is erecting an addition to its plant, 75 x 200 ft. It is of steel and concrete construction. The company is crowded with work and is running its plant night and day. The company reports that it has recently received considerable railroad work.

The National-Acme Mfg. Company, Cleveland, is running its plant at full capacity and is well filled with orders in both its machinery and products departments. In its machinery department it has nearly enough orders on hand to keep the plant running full for the balance of the year.

It is announced from Akron, Ohio, that the B. & M. Machine Company, which was recently incorporated in that city with a capitalization of \$10,000, will build a new plant. The company has elected the following officers: K. L. Meredith, president; A. T. Meredith, vice-president; S. H. Boyd, general manager; O. T. Lane, secretary, and A. E. Kile, treasurer.

N. W. Thomas, formerly connected with the Industrial Machinery Company, has established a machine shop at 5346 Hamilton avenue, under the name of the Thomas Machine & Mfg. Company, for the manufacture of special machinery and automobile parts. Within the next few months he expects to purchase considerable additional machine tool equipment.

The Firestone Tire & Rubber Company, Akron, Ohio, has purchased a 15-acre site and secured options on adjoining property on which it will erect a large modern plant. Owing to the growth of the automobile tire business the company finds that its present capacity is entirely inadequate. Plans for the new plant have not yet been prepared. The company now has a well equipped machine shop and does not expect to be in the market for much additional machine tool equipment.

The Acme Machinery Company, Cleveland, reports a steady improvement in the demand for bolt and nut machinery. The company has a large number of orders on hand and is now running its plant at nearly its full capacity.

The Fanner Mfg. Company, Cleveland, reports that it is running with its normal force, being very busy in all its departments, the demand being especially heavy for malleable and light gray castings.

Mather & Waechter, machinists and tool makers, Cleveland, now located at 224 High avenue, are building a new shop, 45 x 150 ft., at 105th street, Quebec avenue and the Nickel Plate track. They do not expect for the present to add any additional machine tool equipment.

Chicago Machinery Market.

CHICAGO, ILL., September 7, 1909.

While but few individual requirements of exceptional size have come into the market within the past three or four weeks, the demand for machine tools is becoming more general among the various metal working industries. It is largely due to this fact that the general volume of new business booked in August compares favorably with that of the preceding month, which was perhaps the largest of the year. Automobile interests are still buying liberally, and while no formal lists of tool requirements have been put out by the railroads, the demand from this source in scattered orders is more extensive than it has been. In like manner a good many orders are coming from manufacturers of railroad equipment, most of whom are busily engaged and find need of better facilities in order to keep pace with requests for prompt execution of orders. Referring to the phenomenal activity in automobile construction and its effect upon the machine tool business, a leading

manufacturer stated that if business is maintained at its present level for the remainder of the year the sales of his concern to this industry alone will exceed the total sales of any previous year. This, of course, includes the demand arising from manufacturers of parts and accessories. A recent tool order placed by an automobile manufacturer included something over 100 Lodge & Shipley lathes, 60 Cincinnati millers and 30 Landis grinders. Another Michigan interest of like character has placed an order for \$125,000 worth of tools for the equipment of a new plant including automatic and semiautomatic screw machines, grinders, gear cutters, multiple spindle drills, &c. While the development of such a productive field for their product is highly gratifying to the makers of machine tools, it is not without its drawbacks. One of these is disclosed in the fact that to man their increasing shop capacities with skilled machinists automobile builders are scouring the country for skilled machinists. Some months ago when machine tool factories were either shut down or running with reduced forces a good many of their employees found employment in automobile shops, and it is understood that substantial advances over the usual scale of wages paid machinists is attracting others in the same direction. Confronted by a period of expansion that is likely to tax productive capacity in machine tools, the question of securing enough skilled help to meet the emergency is obviously one of serious importance. Those conversant with the situation are strongly of the opinion that the result will be higher labor costs with a corresponding advance in prices. The extraordinary rapidity of expansion is strikingly illustrated in the case of a prominent automobile factory in a thriving Michigan town. The number of its employees has increased so fast that it has been impossible to find houses for their accommodation in the town. Several hundred of these employees are now living in tents in the vicinity of the plant; but such shelter will scarcely suffice for the winter months and another problem is here encountered.

Among the new plants to be erected in the Calumet District is one for which a site of 33 acres has been purchased and plans prepared by the Cudahy Packing Company, Omaha, Neb., which will construct an extensive plant for the manufacture of a product known as Old Dutch Cleanser. Arrangements are being made to hurry this project to completion as quickly as possible, as it is desired to have the plant in operation early next year. It is understood that no orders have been as yet placed for boilers, engines, electrical machinery and other equipment required for motive power. On the same site the company contemplates the establishment of a car manufacturing and repair shop to take care of its own rolling stock. The erection of this department of the works, will, however, not be undertaken immediately, but will likely be included in the improvements of 1910.

The Mason Automobile Company, Des Moines, Iowa, has completed arrangements for the removal of its factory on November 1 to Waterloo, Iowa, where it will occupy the plant formerly owned by the Cascaden Mfg. Company. These works were built some years ago for an automobile factory and as far as they go are adapted to the company's requirements. A new addition 100 x 300 ft., three stories, will be added, together with an office building and display room. In order to take care of its increasing output and contemplated expansion of business, the capital stock of the company will be increased to \$1,000,000. Plans for new machinery equipment have not been fully worked out, but it is expected that considerable machinery will be purchased for the existing plant and the addition to be built. The company proposes to put out 2500 to 3000 cars next year, and to accomplish this it will be necessary to largely increase its manufacturing facilities.

The Gold Springs Mining & Power Company, Salt Lake City, Utah, has let a contract to the Westinghouse Machine Company, Pittsburgh, to erect and equip a power plant at Modena, Utah. Equipment to be installed in the plant will consist of two Westinghouse type T gas producers, two Westinghouse gas engines, two Westinghouse generators, with complete additional electrical equipment. Additional equipment to be installed at the mine consists of electric hoist, 100 hp. compressor, motors, crushers, cyanide tanks, 10 miles of transmission line and other material, for which the company will place contracts in a few days.

The Interurban Electric Company, Carterville, Ill., now in the process of organization with a capital stock of \$150,000, proposes to enlarge a plant which it is acquiring by the installation of a 300-kw. turbine and will also run transmission lines to Carterville and Reeves from Herrin, Ill. A power load will be operated in day time.

By order of the City Council, a large proportion of the houses in Chicago have been renumbered, the new addresses becoming effective September 1. This order, which included business as well as residence property, has changed the addresses of many business houses. Among the machinery interests, house numbers have been changed as follows: A. D. White Machinery Company, old No. 19 South Jefferson street, new Nos. 108 to 114 North Jefferson street; Marshall & Huschart Machinery Company, old No. 62 South

Canal street, new Nos. 13 to 15 North Canal street; McDowell, Stocker & Co., old No. 16 South Jefferson street, new Nos. 117, 119, 121 North Jefferson street; Hill, Clarke & Co., old No. 14 South Canal street, new Nos. 125-127 North Canal street; H. A. Stocker Machinery Company, old No. 91 West Randolph street, new Nos. 566-572 West Randolph street.

Philadelphia Machinery Market.

PHILADELPHIA, PA., September 7, 1909.

Merchants report somewhat quieter conditions, but manufacturers are experiencing considerable betterment in the demand. Inquiries have been more plentiful, coming from a widely scattered territory. Practically every local builder of machine tools notes a steady increase in the volume of business, and, with nearly every one, the number of orders placed on the books in August show a material gain over that of the previous month. Almost all builders of machinery and tools are now running their plants on full time, although but few report their full complement of working forces employed. Good mechanics are reported scarce, but it is believed that in the near future the majority of the plants will be running full handed.

Single tool purchases have predominated during the week. Buyers, however, when ready to purchase want prompt deliveries, and stocks on hand, both in dealers' warehouses and on builders' floors, are decreasing rapidly, and in some lines have been practically cleaned out, so that a perceptible lengthening of promised deliveries on the popular sizes and classes of machine tools is not unlikely. Prices also show a tendency toward higher figures, particularly as prices of raw materials have been steadily moving upward.

As far as the future is concerned, the outlook is decidedly favorable; industrial establishments and iron and steel making plants are becoming more and more actively engaged, resulting in the employment of a larger proportion of long idle machinery. Buying for replacement of deteriorated tools is expected to develop shortly, while inquiries which have been before the trade for some time and are yet unclosed, will, it is believed, materialize into business more freely.

Very little business for export has come out, and those who at times export more or less freely report that class of business rather quiet.

The volume of business in second-hand machinery has been small, and the demand continues of an irregular nature. Second-hand boilers and engines have been rather dull, but the demand for new equipment shows improvement, although orders are not placed as freely as the trade would desire.

John M. Windrim, architect and engineer, has asked for bids on alterations and additions and equipments for the boiler room of the west power house for the Girard College.

The Swartz Wheel Company, Margaret street and Pennsylvania Railroad, Frankford, will have two batteries of drying kilns, 19 x 110 and 34 x 104 and 60 ft. respectively, built by the H. E. Grau Company.

Plans for a new municipal electric lighting plant to be built at Orange, N. J., have been approved by City Councils. Plans are by Runyan & Carey, Newark, N. J.

The New York Shipbuilding Company, Camden, N. J., and the Wm. Cramp Ship & Engine Building Company of this city, it is unofficially announced, will receive the contracts for the two new battleships on which bids were recently asked by the Navy Department. The Maryland Steel Company will, it is stated, get the contract for the new fleet collier, for which it was the lowest bidder. Continued activity will thus be assured the leading shipbuilding concerns in this vicinity.

The Hess Machine Works reports business during the month of August considerably better than that for the previous month. Its plant is now running on full time, although the working force is not yet up to the maximum. Orders for filemaking machinery from Germany, as well as from a number of domestic customers, particularly in New England, are reported. One set of filemaking machines has recently been shipped to Germany.

The Espen Lucas Machine Works is quite busy, operating its plant on full time and steadily increasing the number of mechanics employed. Recent orders have been in good number, and in some lines stocks of tools have been practically cleaned up. The demand appears to cover the general line of cold saw cutting off machines, as well as special tools, sufficient orders for which are in hand to keep the plant well employed for several months.

The Harlan & Hollingsworth Corporation, Wilmington, Del., is understood to be increasing its working forces quite materially. Considerable business in steamboat and steamship building has recently been taken. Work on the new car shops of the company is progressing rapidly, and they will be ready for occupancy in the near future.

The Baldwin Locomotive Works notes a steady increase

in the volume of business coming in. The principal order taken recently was for 35 locomotives for the St. Louis & San Francisco Railroad, 20 of which are to be engines of the Pacific type and 15 of the consolidation type. Scattered orders are also being received from industrial concerns, indicating the return of more prosperous conditions in that field. The Baldwin Works is now operating its plant on full day turn, 10 hr. a day, and is gradually building up its force of employees, which now numbers 7000. Plans previously reported for improvement to both the local and Eddystone plant are still being considered, but have not yet been definitely decided upon.

Government Purchases.

WASHINGTON, D. C., September 7, 1909.

The Quartermaster, United States Marine Corps, Washington, D. C., will receive bids until September 20 for furnishing the depot of supplies at Philadelphia, Pa., one horizontal side crank engine, 15 x 20 in., and one 100-kw. alternating current 220-volt two-phase generator, with switchboard complete. Proposals for the engine are to be submitted independently of the generator.

The Isthmian Canal Commission, Washington, D. C., will receive bids until September 27 for forge blowers, cutter engine, traveling crane, jet pumps and other supplies.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until September 28, schedule No. 1613, for four 8-in. turret turning equipments, with spare parts, including eight 15-hp. motors, four turret turning controllers, four magnet touches and four large motors for circuit breakers, four small motors, rheostats, &c.

The following bids were opened August 31 for machinery for the navy yards:

Class 1, one oxygen acetylene welding and cutting plant—Bidder 58, Davis-Bournonville Company, New York, \$5565.

Under bids opened August 3 for machinery for the navy yards, the Whiting Foundry Equipment Company, Harvey, Ill., has been awarded class 1, two electric jib cranes, \$3350.

Under bids opened August 10 for machinery for the navy yards, the D'Olier Engineering Company, Philadelphia, Pa., has been awarded class 72, four electrically driven centrifugal machines, \$1700.

Under bids opened August 23, Circular No. 527, for machinery for the Isthmian Canal Commission, the Universal Trading Company, New York, has been awarded class 2, one marine feed water heater, \$447.48.

The Henry J. Martin Forging Company.

Under the above name, a corporation composed of local interests at Indianapolis, Ind., has been organized with a capital stock of \$75,000 for the purpose of manufacturing drop automobile and special forgings. It will be under the immediate direction of Henry J. Martin, long and favorably known to the trade through his successful management of the Indianapolis Drop Forging Company in the capacity of receiver, which receivership was recently released, Mr. Martin and associates handing over to its former owners the property in a most prosperous condition. The new company will at once erect a substantial fireproof building located on the Belt Railroad, Harding street, near Oliver, specially designed for the purpose, and thoroughly equipped with the latest tools and appliances, among which will be 12 steam hammers.

The officers of the new company are as follows: Henry J. Martin, president and general manager; Carl H. Graf, vice-president, and Augustus Jennings, secretary and treasurer. Temporary offices will be located at 209 Majestic Building, Indianapolis. It is expected to commence operations within 60 days.

The Maryland Steel Company, Sparrows Point, Md., was the lowest bidder on the collier wanted for the United States Navy. The bids were as follows: Maryland Steel Company, to be completed in 20 months, Class I, according to Navy Department's design for hull and machinery, \$889,600; according to builders' plans, \$940,200; Moran Company, Seattle, Wash., \$898,000; William Cramp & Sons Ship & Engine Building Company, Philadelphia, \$899,900; Newport News Shipbuilding & Dry Dock Company, Newport News, Va., \$900,000; Fore River Shipbuilding Company, Quincy, Mass., \$974,000, and the New York Shipbuilding Company, Camden, N. J., \$1,050,000. The vessel must have coal carrying capacity of 12,500 tons.

Iron Ore Production in 1908.

The forthcoming annual report of the United States Geological Survey on the production of iron ore in 1908 will show a heavy decline as compared with 1907 and even with 1906 and 1905. The total output in 1908 was 35,983,336 gross tons, valued at \$81,845,904, as compared with 51,720,619 tons, valued at \$131,996,147 in 1907, and 47,749,728 tons, valued at \$100,597,106 in 1906. All the important producing States shared in the decline, as did also all the principal varieties of iron ores.

The production of iron ore by States in 1908, compared with 1907, is shown in the following table, in gross tons (tons of 2240 lb.):

	1908.		1907.	
	Tons.	Value.	Tons.	Value.
Alabama	3,734,438	\$4,358,902	4,039,453	\$4,863,129
Georgia	321,060	540,189	444,114	837,102
Michigan	8,839,199	25,150,861	11,830,342	36,441,330
Minnesota	18,652,220	42,313,974	28,969,658	76,668,836
Missouri	98,414	218,182	*111,768	*226,286
New Jersey.....	394,767	1,162,474	549,760	1,815,588
New York.....	697,473	2,098,247	1,375,020	2,820,135
No. Carolina...	48,522	76,877	50,439	113,488
Ohio	26,585	36,736	23,589	41,081
Pennsylvania...	443,161	572,346	837,287	1,289,717
Tennessee	635,343	876,007	813,690	1,325,134
Texas	55,966	30,663	†118,667	†120,060
Virginia	692,223	1,465,691	786,856	1,538,920
Wisconsin	733,993	2,027,208	838,744	2,665,737
Colorado, Mont- tana, Nevada, New Mexico, Utah, Washing- ton, Wyoming.	528,625	772,192	‡831,258	‡988,275
Connecticut, Massachusetts.	28,112	105,457	37,166	136,440
Kentucky, Mary- land, West Vir- ginia	53,235	84,898	62,808	95,891
Totals.....	35,983,336	\$81,845,904	51,720,619	\$131,996,147

* Includes Iowa. † Includes Arkansas. ‡ Includes California.

It will be noted that the two largest producing States in 1908, namely, Michigan and Minnesota, showed a percentage decrease in excess of that of the total output for the entire country.

The Garland Corporation's Financial Statement.

The Garland Corporation, Pittsburgh, whose constituent companies are the Safety-Armorite Conduit Company, Garland Nut & Rivet Company, Woodhouse, Bopp & Co. and West Pittsburgh Realty Company, has issued the following financial statement as of June 30, 1909:

Assets.	
Property account:	
Properties owned and operated by the several companies	\$3,453,559.91
Deferred charges to operations.....	82,971.19
Investments:	
Stocks owned.....	\$149,639.88
Current assets:	
Inventories	621,577.49
Accounts receivable.....	643,738.09
Bills receivable.....	17,497.85
Cash	148,255.87
Total.....	\$5,117,240.28
Liabilities.	
Funded debt:	
Garland Corporation 30-year 6 per cent. bonds..	\$1,500,000.00
Current liabilities:	
Accounts payable.....	\$270,887.16
Bills payable.....	339,879.01
Unclaimed wages.....	116.05
Bond interest due July 1.....	45,100.00
Surplus	655,982.22
Total.....	\$2,961,258.06
Total.....	\$5,117,240.28

The capital stock authorized is \$3,000,000; issued, \$2,439,000. The net earnings for six months ending June 30, 1909, were \$103,209.18.

The Great Northern Railway Company is planning the construction of a large new ore dock in the vicinity of Superior, Wis., but work will probably not be actively undertaken for nearly a year.

HARDWARE

IT is a matter for congratulation that there is at this time so much ground for hopefulness in regard to the business outlook and so much encouragement to stimulate the putting forth of effort in the prosecution of commercial enterprise. The situation is thus radically different from that which confronted merchants and manufacturers at the opening of the fall last year and the previous year. While it would be too much to say that all the effects of the financial disturbance have been overcome, there is no doubt that the situation is immensely improved and is in some respects probably better than ever before, while steady progress is still being made toward further betterment. The necessity for extreme caution, for the exercise of painful economies, for a curtailment rather than an increase of enterprise, has passed, and there is now an opportunity for the pursuing of a bolder policy, the taking hold of new departments of activity, the application to the conduct of business of a greater courage and an enlarged enterprise. Goods may be bought more freely and expenditures for the extension of business be made more liberally. In connection, however, with this comfortable feeling of hopefulness which has its own perils there should be in store and factory a quickening of activity, as every one in the establishment from proprietors down recognize that the time has come for taking a new start and making new records in effort and efficiency.

With the entrance upon the fall months, Labor Day passed and the vacation season over, the resumption of work with fresh energy and enterprise is in order. Even those who voluntarily continued at the habitual grind or those who were prevented by adverse circumstances from enjoying the longer or shorter respite from the regular duties of business, which is increasingly the privilege of business men and their employees, feel the call to a quickened activity. The rest and pleasure of the summer months, to whatever extent enjoyed, have presumably served their purpose, as the great body of workers have been given a preparation for taking up again tasks and responsibilities with renewed interest and enthusiasm. Unless the vacation, more or less formally taken, and the relaxed attention to regular work have thus given a new spirit and a new strength to the workers the summer days of ease and pleasure have passed without yielding some of their best fruit. It is to be hoped that recreation, rest and enjoyment, the cultivation of faculties, perhaps the gentler and nobler which are sometimes neglected in the steady pressure of imperative cares, and the manifold benefits of vacation, however spent, will contribute to health and happiness, to efficiency and success in the days to come. The strength of body thus secured, the alertness and vigor of mind, the increased enthusiasm and earnestness with which old responsibilities are assumed with a more glad and courageous spirit, should be important assets in entering upon the season which is now open.

Condition of Trade.

With the development of the improved conditions to which it has been our privilege to call attention in all our recent issues, there is coming to be a general recognition on the part of the business world that we are entering on an era in which trade may be expected to resume free movement and large volume. The experienced judgment of trained observers has been able during the past few months especially to note the indications of a decided business revival and the near approach of renewed prosperity. There is now getting to be a pretty general recognition of the decided change for the better in commercial, industrial and financial affairs with the prospect of fine business during the remaining months of the present year and longer. The depression and restraint which resulted from the financial disturbance having been gradually overcome, the curtailment and economies practiced, the correction of unwise methods and excessive expansion, have removed most of the hindrances to safe and profitable business. In this improved condition of things the magnificent returns from the soil have furnished a substantial basis for the prosperity of the agricultural classes, in which ultimately the whole country shares. Definite evidences of quickened trade are seen in the increased transactions reflected in clearing house statistics, the renewed activity in railroad equipment, the marked improvement in the business of the railroads, the revival of industry and enterprise generally, and, notably of late, in the growth of public confidence and hopefulness as to the future. The condition of the Iron market, too, confirms this sanguine attitude. In all this movement the Hardware market has its full share. The higher prices for the raw material are having effect on the prices of the manufactured product. A good many definite advances are being quietly made with a gradual withdrawal of special concessions and privileges where no open change has yet occurred. The volume of business, too, is increasing, and August, notwithstanding the fact that it is a quiet month in some respects, made an excellent record. While its general business showed the effects of the summer and vacation season, its record was on the whole eminently satisfactory. With the entrance of September there is already evident the quickening influence of the work of the traveling salesmen and of the more aggressive attention to business on the part of merchants. The factories, too, are increasing their output, many of them finding demand in excellent volume with a call for prompt shipments. The fall thus opens under very favorable auspices.

Chicago.

Business in the Hardware line for the month of August was not on the whole of a record breaking character so far as new demand is concerned, but the steady, even development of trade experienced is leading the way to a more substantial and enduring basis of prosperity than would come from a too insistent and crowding demand. Indeed the gradual conservative pace at which things are going in the Hardware trade is one of the surest indications of lasting improvement. While the general tendency of values is upward, neither manufacturers nor jobbers are making abnormal or hasty advances unsupported by basic conditions. In the heavy staples, such as Wire Nails, Fence Wire, &c., new buying is comparatively light, but in view of the heavy contracts placed earlier in the season at the low prices then ex-

isting, and against which liberal specifications are still being made, a strong buying movement is hardly to be expected at this time. But unless all estimates of fall consumption, based upon the extraordinary production of farm and field and the wealth that will accrue therefrom are wholly in error, new purchases of large extent must yet be made to meet the requirements of users of such goods. Building construction continues at a remarkable rate, and activity in this direction is reflected in a constantly widening market for building material, tools and Hardware. The effects of such expansion are particularly noticeable in Builders' Hardware, the makers of which are finding more or less difficulty in keeping abreast of demand. The leading factories in this line are already running behind on deliveries, and jobbers cannot rely upon the prompt execution of orders for the replenishment of stocks. The same condition exists on Galvanized and Black Sheets, the delay being more pronounced on the heavier gauges of Blue Annealed. Some talk is heard of an impending advance in prices of Butts and Strap and T Hinges, the realization of which is considered not improbable, owing to increasing cost of the material from which they are made. The outlook for a satisfactory volume of business with more general firmness in prices in all lines is unclouded by any threatening features now that the safety of the principal crops are practically assured.

NOTES ON PRICES.

Wire Nails.—The large trade appears to have covered its requirements by orders placed during May, when the lower prices ruled, as business now received by the mills is in moderate volume. The manufacturers are still making shipments on these orders, and until they have been about cleared up large buying is not expected. Many smaller lots are, however, being purchased. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....	\$1.80
Carload lots to retail merchants.....	1.85
Less than carloads to jobbers.....	1.85
Less than carloads to retail merchants.....	1.95

As the result of a marked increase in the demand for Boat Spikes, there has been an advance of from 5 to 10 cents in the price.

New York.—Demand continues moderate in the local market, and quantities are confined to immediate requirements. Wire Nails are generally held at the base price of \$2 per keg for small lots at store.

Chicago.—Shipments against old contracts placed at prices ruling prior to the last advance are still going forward, but these will be completed within a few weeks at the latest. Conditions are favorable to large fall demand, which, when fully open, is expected to keep the mills busy. Compared with the phenomenal rush of business which followed the drop in prices last spring, new buying is at present light. Some new orders, however, are being placed at the ruling prices of \$1.80 per keg, Pittsburgh. The railroads are buying more liberally than for some time. Prices are firm at \$1.98, Chicago, in carloads to jobbers, and \$2.03 in carloads to retailers, with an advance of 5 cents for less than carloads from mills.

Pittsburgh.—New buying of Wire Nails is very light at present, the jobbers and retailers having placed liberal orders during May at the \$1.60 and \$1.70 base price, and have been specifying liberally against these contracts. There is some little new buying at the present price of \$1.80, but these are mostly small lots. It is expected that when the contracts now on the books of the mills taken in May have been pretty well cleaned up new buying will be more active than it is at present. The market is referred to as being in satisfactory condition, and prices are being observed. We quote Wire Nails at \$1.80, base, f.o.b. Pittsburgh, in carload and larger lots.

Cut Nails.—The market continues in about the same condition as for some time, with the exception that \$1.75,

base, is more generally adhered to by some mills, while others are asking \$1.80. Some new business is being placed, and the mills are also engaged in filling contract orders. Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails in the Western market, but in the East this differential is not observed.

New York.—The local Cut Nail market continues along former lines, with a moderated demand for small lots at store, the general price is \$2 per keg, base.

Chicago.—While not sharing in full measure the demand for Wire Nails, the movement in Cut Nails is marked by moderate improvement. Prices, though not evenly maintained by all makers, are tending toward greater uniformity. Subject to slight shading by some mills, we quote as follows: In car lots to jobbers, Steel Cut Nails, \$1.93; Iron Cut Nails, \$2.03.

Pittsburgh.—A fair amount of new business is being placed, but the Cut Nail mills are running mostly on contracts placed some time ago, and against which buyers are specifying at a fairly liberal rate. The market is growing firmer, and \$1.75, base, for Cut Nails seems to be minimum, with several mills asking \$1.80, base. There is a decided scarcity in supply of Steel Slabs, and some Cut Nail mills that buy Steel in the open market are having trouble in getting prompt deliveries. We quote Cut Nails at \$1.75, base, f.o.b. Pittsburgh, and we are advised this price is being firmly held. Iron Cut Nails are held at an advance of 10c. a keg over Steel Cut Nails in the Western market.

Barb Wire.—Fall buying has not reached as large proportions as is expected later in the season. The market is firm and quotations are as follows, f.o.b. Pittsburgh:

	Painted.	Gal.
Jobbers, carload lots.....	\$1.80	\$2.10
Retailers, carload lots.....	1.85	2.15
Retailers, less than carload lots.....	1.95	2.25

Chicago.—New demand is somewhat backward, the orders now being placed being comparatively light and scattering. The mills, however, expect a heavy volume of business when the fall trade opens up in earnest, as it is expected to do in the near future. Prices are firm and unchanged at the following quotations. We quote as follows: To jobbers, Chicago, carloads, Painted, \$1.98; Galvanized, \$2.28. To retailers, carloads, Painted, \$2.08; Galvanized, \$2.38; retailers, less than carloads, Painted, \$2.13; Galvanized, \$2.43. Staples, Bright, in carloads, \$1.98; Galvanized, \$2.28; carloads, to retailers, 10 cents extra, with an additional 5 cents for less than carloads.

Pittsburgh.—There is some new buying in small lots, but the full impetus of the fall trade demand is not yet being felt by the mills. It is believed that new demand will materially expand later on and that fall trade will be quite active. The market is firm, and we quote Galvanized Barb Wire at \$2.10 and Painted at \$1.80 in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms. There still remain some contracts to be filled by the mills taken at lower prices and against which specifications are being received.

Fence Wire.—There is more activity in Fence Wire than in Barb Wire as there is a fair amount of new business being received by the mills. Heavy shipments are also being made on contract orders. The market is firm at the following quotations per 100 lb. to jobbers in carload lots as follows, on a basis of \$1.60 for Plain and \$1.90 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional:

Nos.....	0 to 9	10	11	12&12½	13	14	15	16
Annealed.....	\$1.60	1.65	1.70	1.75	1.85	1.95	2.05	2.15
Galvanized.....	1.90	1.95	2.00	2.05	2.15	2.25	2.35	2.45

Chicago.—Manufacturers are generally busy and are specifying freely against existing contracts. A fair amount of new orders are being placed, and heavy shipments are going forward from the mills. Prices are firm at the ruling quotations, which we quote as follows: Carloads, to jobbers, \$1.78, base, f.o.b. Chicago.

Pittsburgh.—The mills are making heavy shipments against contracts placed earlier in the season when prices were lower than they are now, but there is a fair amount

of new business being placed at present prices. It is believed demand for Fencing this fall will be unusually large, and the mills expect a very heavy volume of business when fall trade opens up. We quote Plain Wire at \$1.60 and Galvanized at \$1.90 in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Wrought Shelf Brackets.—On September 4, the price on Wrought Iron Shelf Brackets was materially advanced, the market now being represented by a discount of 80 per cent. from the list used by the leading makers of these goods. At the prices formerly ruling several sizes are said to have been sold at less than cost.

Pitcher Spout Pumps.—Among the lines which lie near the raw material, and thus feel the effect of the higher costs now ruling, are the common grade of Pumps. As a result some of the low prices ruling on Pitcher Spout Pumps have been withdrawn and higher quotations announced. The advance while not heavy indicates an improved condition of things.

Axles.—Manufacturers of Axles are working together with a good degree of harmony and with a quickened demand the market is in good shape. A slight advance in prices has recently been made.

Sash Weights.—The Sash Weight market is firm owing to the increase in the price of raw material and the demand for the finished product. A prominent manufacturer in the Central West has recently advanced prices \$1 per ton. The Eastern market is represented by the quotation of \$25 per ton.

Plumbers' Brass Goods.—An official illustrated price-list of Plumbers' Brass Goods, adopted by the Brass manufacturers of the United States and Canada, has been issued, becoming effective September 1. It is a book of 125 pages, each 10 x 6¼ in., and includes such lines as ground key, compression and Fuller work in Bibbs and Cocks, Self-closing Bibbs, Stops and Cocks and kindred goods. There has been a thorough and painstaking refiguring of the lists, which are higher than formerly, and while there has been no uniform advance the present prices are estimated to average about 10 per cent. higher than those superseded.

Building Paper and Tarred Felt.—The trade in Building Paper, Tarred Felt and similar products is improving somewhat and prices are steady, without fluctuations of much importance. While more business would be welcome and could readily be handled the demand is good, and advances are not now anticipated. The situation is referred to as showing healthy progress, but without particular feature. The market is represented by the following prices: Rosin Sized Sheathing, 500 sq. ft., light weight, 25 lb. to roll, 38 cents; medium weight, 30 lb. to roll, 45 cents, and heavy weight, 40 lb. to roll, 60 cents per roll. Black Waterproof Sheathing, 500 sq. ft., light weight, 65 cents; medium weight, 95 cents, and heavy weight, \$1.30 per roll. Deafening Felt, 9 and 6 sq. ft. to pound, per ton, \$40. Red Rope Roofing, 250 sq. ft. per roll, \$1.75. Tarred Paper, 1 ply (roll 400 sq. ft.), less than carloads, \$32 per ton, and in carloads, \$31 per ton. Two ply roll, 108 sq. ft., 40 lb., 48 cents; three ply, roll 108 sq. ft., 60 lb., 68 cents per roll. Slaters' Felt, roll 500 sq. ft., per ton, \$35, or an average of about 70 cents per roll.

Rope.—It is too early in the month to determine whether demand will increase in proportion to manufacturers' desires. Some report that August was not as fruitful in business as July, while others report an increase in its sales over those of July. It is expected now that vacation time is over and Labor Day is past buyers will give more attention to sorting up stocks. The following quotations represent the market for moderate quantities: Pure Manila of the highest grade, 8¼ to 8½ cents per pound; lower grades of Pure Manila, ¼ to ¾ cent less than the foregoing quotations. Pure Sisal of the highest grade, 7½ to 7¾ cents per pound, base; Commercial grade, 6¼ to 6½ cents per pound. Rove Jute Rope, ¼ in. and up, No. 1, is quoted at 5 cents per pound.

Window Glass.—The cutters and flatteners employed by the American Window Glass Company, manufacturer of machine blown Glass, presented a wage scale for the blast of 1909-1910 to the company last week. This provided for an increase in wages, at the expiration of the former scale, which terminated at midnight of September 3. It is understood that several conferences were held by representatives of the company and the workmen without arriving at any conclusion. According to press reports 5000 men employed by the company are idle, as the result of a strike inaugurated September 4, to obtain an increase in wages, and that notices were posted in six machine blower factories that the plants would be closed at once. If this report is true it will probably have a strengthening effect upon the Glass market generally. Additional hand blown Window Glass factories are being put in operation and manufacturers look for an increase in demand. Prices recommended by the Eastern Window Glass Jobbers' Association, from jobbers' list, October 1, 1903, for territory east of the Alleghany Mountains, are as follows: New England States, from jobbers, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, factory shipments, Single, 90 and 45 per cent.; Double, 90 and 50 per cent.; some portions of Pennsylvania are accorded discounts 5 per cent. better than other States; in the Southern States discounts vary from 90 and 25 to 90 and 40 per cent. on Single and from 90 and 30 to 90 and 45 per cent. on Double, from jobbers.

Linseed Oil.—The market has shown more activity as the result of lower prices, but in the majority of cases orders are restricted to jobbing lots. Large buyers, to some extent, placed contract orders when lower prices were ruling, and these contracts do not expire until October 1. Some manufacturing consumers are reported as having placed carload orders on the basis of 55 cents for Western Raw, for spot cash. It is possible that additional orders of this kind could be placed at 1 cent less per gallon. Quotations for 5-bbl. lots are on the basis of 56 cents for Western Raw. Boiled Oil is 1 cent advance per gallon on Raw.

Spirits Turpentine.—The local market has declined 1 cent per gallon during the week on Southern reports of not so active demand. Business at this point is confined to jobbing lots, as large consumers are not attracted by the high values. The New York market is represented by the following quotations: Oil Barrels, 58½ to 59 cents; Machine Made Barrels, 59 to 59½ cents per gallon.

Buffalo Retail Hardware Merchants' Outing.

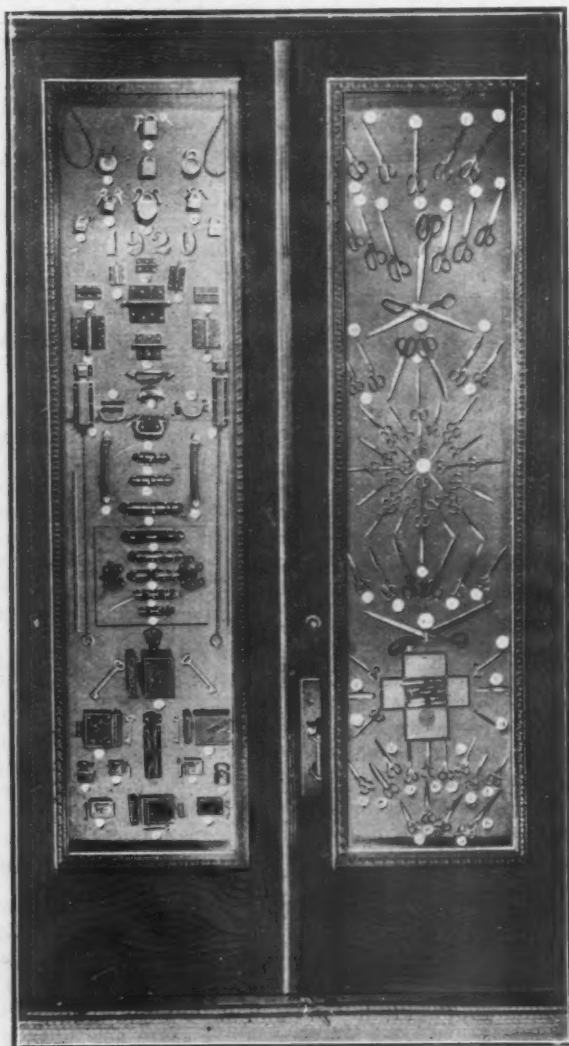
THE Buffalo Retail Hardware Merchants' Association enjoyed an outing to Detroit on the 21st and 22d ult. Leaving Buffalo on Saturday they arrived in Detroit on Sunday morning, where the members of the Detroit and Suburban Hardware Dealers' Association, headed by President Mason, were at the dock to extend greetings. The Buffalo party then went to the Hotel Normandie, its headquarters. As guests of the Detroiters the Buffalonians were given a very interesting and enjoyable ride through the city and suburbs in a special car. The visitors were then taken across the Detroit River and around magnificent Belle Isle Park in automobiles.

Returning to the hotel an elaborate dinner was served after which adjournment was made to the parlor where felicitous remarks were made by President Mason of the Detroit Association, to which an appropriate response was made by Charles E. Eisele of the Buffalo organization. Other addresses were made by William Moore, A. Harsha, O. J. Darling, W. F. Gould and George G. Allen, secretary of the Buffalo Association. The general sentiment expressed by the speakers was that Hardwaremen cannot come together too often, as a recital of their trade experiences cannot but be beneficial to all. The outing was thoroughly enjoyed and was one of the pleasantest trips in the history of the Buffalo Association.

Effective Auxiliary to Window Exhibit.

Making Store Doors Work at Night When They Are Closed.

It may have been considered rather unfairly the Spiro Hardware Company, Birmingham, Ala., to make its show windows exhibit goods, while the doors did nothing but swing lazily to and fro during the day and remain closed at night. Whatever caused the door innovation, the accompanying illustration shows that the doors are up against sample boards, each made of two 1/2-in. pieces put together, upon which samples are fastened. A narrow shelf on the inside of each door supports the boards, and they are held in position against the glass by square



A Simple and Effective Way to Advertise, Especially at Night,
Used by the Spiro Hardware Company, Birmingham, Ala.

shouldered screw hooks, four to each board. One board is sampled with Builders' Hardware and the other with Shears and Scissors.

The goods are attached to the boards by means of small tin strips fastened with brass head tacks. Every article is priced in large plain figures, causing people to linger longer in the inspection of the display than they would if no prices were shown. When the doors are closed and the entire front of the store is lighted up at night the doors make an attractive and impressive display.

D. S. Henderson, Jr., has purchased the interest of J. Wesley Stewart in the Stewart-Suydam Hardware Company, Columbia, S. C. For the present the business will be continued under the old name.

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Death of Charles X. Cordier.

CHARLES X. CORDIER died at his home in New York City August 31, having been critically ill since last May. He was born in New York, June 25, 1846, of French parentage, and had been identified with the Hardware and kindred trades the greater portion of his business life. When yet a boy he ran away to enlist for service in the Civil War, belonging to both the 12th Regiment, New York Volunteers, and a Zouave regiment.

His first business employment was with the Lalancé & Grosjean Mfg. Company, of which his brother, Augusté J. Cordier, eventually became president, and another brother, Julian P. Cordier, representative in Chicago. Still another brother was connected with the company at the works in a responsible position. Charles X. Cordier was with the well-known brass and copper manufacturers, Wallace & Sons, Ansonia, Conn., for 14 years, and later with the Union Hardware Company, Manhattan Brass Company and Park Bros. & Co. Subsequently he



CHARLES X. CORDIER.

became New York manager and a director of the Bridgeport Brass Company. After severing connection with the latter house he became manager of the New York branch house of Randolph & Clawes. At the time of his death and for the preceding eight years he was Eastern agent for the Ross-Tacony Crucible Company, Philadelphia.

Mr. Cordier was of a companionable nature and a man of many acquaintanceships, formed largely during the many years he traveled in selling goods. He leaves a widow, one daughter and a son, Charles X. Cordier, Jr. He belonged to the Royal Arcanum, was a member of the Hardware Club for several years and until his decease was a trustee of the State Savings Bank.

Association of Edison Purchasing Agents.

AT a meeting of the Association of Edison Purchasing Agents, held at Briarcliff Lodge, Briarcliff Manor, N. Y., the following officers were elected for the ensuing year: President, H. C. Lucas, Philadelphia Electric Company, Philadelphia, Pa.; first vice-president, W. H. Francis, Edison Electric Illuminating Company, Boston, Mass.; second vice-president, J. W. Brennan, Edison Illuminating Company, Detroit, Mich.; secretary, H. F. Frasse, Edison Electric Illuminating Company, Brooklyn, N. Y.; treasurer, Andrew Banks, Jr., Consolidated Gas, Electric Light & Power Company, Baltimore, Md., and stock controller, J. J. Miley, Minneapolis General Electric Company, Minneapolis, Minn.

The meeting took place simultaneously with the convention of the Association of Edison Illuminating Com-

panies. Several new members were enrolled, and at the present time the roster of the association includes representatives of about 35 per cent. of the Edison illuminating companies throughout the country. This association was organized several years since, with a view to promoting a better acquaintance among this class of officials and for general information and friendly business intercourse.

Chicago Special Train to the Atlantic City Conventions.

AS already noted, a special train will be run from Chicago to Atlantic City, N. J., on the occasion of the annual conventions of the American Hardware Manufacturers' Association and the National Hardware Association, which will be held at the Marlborough-Blenheim Hotel, on October 13, 14 and 15. A booklet just issued gives the itinerary and other particulars in regard to the trip. The special train will come through on an entirely different route from that followed in past conventions at the famous watering place. It will be run from Chicago to Albany as second section of the Twentieth Century Limited, and from Albany to Jersey City will run over the West Shore tracks, giving an excellent view of the Hudson River by daylight. On arrival at Jersey City the train will be transferred to the New Jersey Central tracks, where it will go direct to Atlantic City.

The train will leave Chicago from the La Salle street station at 2.45 p.m., October 11, and will make official stops at Toledo, Cleveland, Syracuse, Oneida, Albany and Jersey City, arriving at Atlantic City at 4 p.m., October 12. Persons wishing to board the train at other points on the route should take the matter up with the committee in charge and arrangements will be made for special stops. The fare from Chicago will be \$23.25, a Pullman berth being obtained for \$5.50; compartment, \$15.50, and drawing room, \$20. Owing to the expressed intention of a considerable number of visitors of remaining at Atlantic City for some time after the meeting no arrangements have been made for a return trip.

The Chicago passenger agent of the Lake Shore Railroad will accompany the party through to Atlantic City for the purpose of seeing that every comfort is provided on the train. Tickets and reservations may be purchased at the city ticket office of the Lake Shore Railroad, 180 Clark street, Chicago. Any further particulars desired may be obtained from W. H. Bennett, Room 403, 40 Dearborn street, Chicago, who is chairman of the Committee of Arrangements.

WILLIAM H. HJORTH & Co., Jamestown, N. Y., manufacturers of Hardware specialties, including Wrenches and Pliers, whose building and stock was recently damaged by fire, have made a settlement with the insurance companies and repairs to the building are now in progress and operations in full will be resumed within a few days.

LIVERIGHT BROTHERS, Philadelphia, Pa., manufacturers of Gold Medal Files, have recently purchased new equipment which is now being installed in their plant and which will double their facilities on certain lines of Files. Business is reported to be moving steadily forward and their plant is being operated on full time.

W. O. SKAGGS has purchased the business of Hopkins & Son, Rossville, Kan., and will handle Shelf and Heavy Hardware, Stoves, Tinware, Housefurnishings, Agricultural Implements, Paints, Oils and Sporting Goods.

E. J. HOEFT, dealing in Hardware, Stoves, Farm Implements, &c., formerly at Caroline, has removed his stock to New Rome, Wis., where he is now located.



This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience, Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

Automobiles and Accessories.

The Extent to Which Hardware Merchants May Advantageously Handle This Line.

One of the letters given below from an enterprising merchant in Minnesota, notes the fact that he is already handling quite a line of automobile supplies, and, what is more significant, keeping an eye on the machines themselves with a view to taking up their sale if conditions seem to warrant it. The subject is evidently receiving careful consideration at the hands of wideawake merchants in communities where the use of these machines is spreading. As already noted, many merchants are handling the accessories, some of which are really items of the regular Hardware stock, and with the increasing use of automobiles by prosperous farmers for business as well as pleasure there will perhaps be opportunity for some Hardwaremen in the great agricultural sections of the country to take up the sale of the machines themselves, although, as has already been made plain in this discussion, this involves the exercise of much ability and attention, and doubtless the erection of a garage. The high position in the community usually occupied by the successful Hardwareman, as pointed out in the letter from a Pennsylvania merchant, would count in his favor if the way seemed clear for him to become an automobile representative.

The following extracts from letters received from merchants in widely separated States will be of interest:

FROM MINNESOTA: We handle quite a line of supplies for automobiles, and are keeping an eye on the automobiles themselves, as I feel that the time is approaching when their sale will be profitable for the Hardware trade.

FROM PENNSYLVANIA: As to the advisability of Hardware merchants adding automobiles and accessories to their line, we hardly feel competent to write concerning this in a way that would be of interest or value to your readers, for the reason that we are just experimenting along this line and are not able to draw any definite conclusion at present. We are of the opinion that the line

Confidence of the Public could be handled profitably by Hardware merchants, but only by the installation of a garage. The prominent position that a Hardware merchant as a rule enjoys in his own town inspires confidence in him as an automobile dealer and gives him certain advantages over the average person entering into this business.

FROM NEBRASKA: We have not added automobile supplies in full for the reason that it requires a definite experience, and to do the subject justice and make the line profitable one must be in touch with all its requirements. However, there are a great many tools that are or ought to be regular stock in a well equipped Hardware store that are used by owners of automobiles and are profitable to handle. We handle a full line of these.

FROM OHIO: I have never sold automobiles but have had the matter under consideration and decided not to stock

or sell them, because I thought it would involve more expense than the profit would amount to. Our city has about 10,000 inhabitants and we have five automobile agents and garages, and it seems to be a distinct business of its own. I do not believe it will become part of the Hardware business in the near future.

Departmentizing Hardware Stores.

An Ohio Merchant's Experience.

Touching on the question as to whether it pays to divide the retail Hardware business into departments, we have an interesting letter from a house in Ohio which has experimented in this direction and has become satisfied that the advantage is decidedly with the department method.

FROM OHIO: We have divided our business into six departments and have worked it thus for several years. We have found it a decided advantage to the business, as it shows the weak line, which leads to an analysis of the cause and how to strengthen the department. Stores of medium size would surely profit by this method and we would recommend its adoption. We believe if a trial was made of one line it would not be long before the various lines in the business would be departmentized. The plan is an interesting study of one's business.

Our departments are six in number, as follows:

No. 1, **HARDWARE**—Builders' and General Hardware, Tools of all kinds, Glass, Putty, Bar Iron, Building Papers.

No. 2, **PLUMBING**—Everything pertaining to Sanitary Plumbing, Hot Water or Steam Heating, Gas and Water Piping, Chandeliers, Gas Lamps, Mantles.

No. 3, **STOVES**—Stoves, Ranges, Stove Pipe and Fittings, Tin, Copper, Enameled and Aluminum Ware.

No. 4, **PAINT**—Lead, Oil, Varnishes, Paints, Brushes.

No. 5, **ROOFING**—Slate and Tin Roofing, Spouting, Hot Air Heaters and all articles made in the shop.

No. 6, **CEMENT**—Lime, Cement, Calcine, Plaster, Plaster Board, Sand or kindred to this line not included in Hardware.

Ent'd F. C.
Order No.
Goods O. K.
Prices O. K.
Ext. O. K.
Hardware
Plumbing
Stoves
Paint
Roofing
Cement
Total

All articles made in roofing department for other departments or furnished from one department to another are charged at a profit of 10 per cent.

All bills received are stamped as indicated herewith, marked with order number and distributed to the different departments, where they are figured as to accuracy and price, and so marked by the clerk having this in charge, by whom checked and entered in forecast for book-keeper to pay at proper time.

Unsalable Disk Plows.

The following inquiry comes from an Arkansas merchant:

We have on hand two Eagle disk plows which were ordered for two farmers who sold their land to the coal company before the plows arrived. As there are no disk plows used around here we thought perhaps you might be able to tell us whether there are any dealers in second-hand implements who might take these plows off our hands. We have been informed that there are parties or firms who take up such goods as these and dispose of them in other parts of the country. Any information that you may be able to give us will be appreciated.

We would suggest that our correspondent communicate with W. L. Harlan, Little Rock, secretary of the Arkansas Retail Hardware Association, who may be in a position to assist him. In this connection, it is worthy of note that several of the State retail Hardware associations are endeavoring to help their members in the way of getting rid of goods, which, while unsalable in one section owing to the absence of any demand, may be disposed of quite readily in another part of the

State. Merchants with stock of this character are thus brought in touch with others more favorably situated, so far as the sale of such goods is concerned, and oftentimes the troublesome articles are taken off their hands with comparatively little loss. This would seem to be a department of work in which the Hardware associations can add to their usefulness and value.

Canadian Hardwaremen in a Unique Trade Excursion.

THE Retail Hardware Association movement has been responsible for many trade innovations, but it is doubtful if anything more unique and more successful has been carried out than the excursion conducted by the Ontario Retail Hardware & Stove Association down Lake Ontario and the St. Lawrence River from Toronto to Montreal, leaving the former city on August 23 and returning August 30. About one hundred from all parts of Ontario participated in the boat trip, while a number of others traveled by rail. The boat trip of 400 miles consumed 28 hours going down the lake and rapids, and 43 hours returning, making three days on the water, four days being spent at Montreal. And about 30 made a side trip to Quebec City, occupying two days longer. Of the hundred in the party about a dozen were traveling salesmen, while 30 more were ladies, the balance being members of the Ontario association.

The visit to Montreal was first suggested last February at the retail Hardware convention at Hamilton, the Ontario association being invited to hold a convention in Montreal. This being considered impossible, owing to Montreal's location in Quebec Province, the summer excursion idea developed, and Montreal Hardware manufacturers and jobbers formed a committee to look after the entertainment of visitors, the chairman of the committee being Fred C. Lariviere, a French Canadian retailer, who has taken an active interest in Hardware association work.

On the trip down Lake Ontario calls were made at several Canadian cities, as well as at Charlotte and Thousand Islands Park in New York State. On the boat the party became well acquainted, an important factor in this being the distribution of song sheets containing 20 popular songs adapted to the occasion. A Hardware yell was also invented, and as time wore on the Hardwaremen became almost as expert as college students in making noise. The "yell" was found to be particularly useful in Montreal in gathering the crowd together when entering or leaving a factory or other point of interest visited. There were also a number of topical songs, with the officers of the association as subjects.

Montreal Hardwaremen Entertain.

From Tuesday night until Saturday noon there was one continual round of entertainment at Montreal, visits being made to a number of factories, including the Sherwin-Williams and Canada Paint Company's Paint plants, Brandram-Henderson White Lead Corroding Works, Thomas Davidson Company's Enameled Ware factory, Montreal Rolling Mills and Gillette Safety Razor Works. The jobbing houses of Caverhill, Learmont & Co., Frothingham & Workman, Lewis Bros. and Starke-Seybold, Ltd., were also visited. An ocean liner was inspected and a trip made around Montreal Harbor as guests of the Harbor Commissioners. Luncheons were given at several of the factories, and on Wednesday night a banquet was tendered the visitors at Dominion Park. On Friday afternoon there was also a civic drive up Montreal Mountain.

Perhaps the most appreciated event on the entire programme was a musical recital given by Fred C. Lariviere on Thursday night in St. Louis de France Catholic Church, a choir of male voices singing Gounod's "Last Seven Words of Christ." After the recital Mr. Lariviere's fine store was inspected, following this there being an evening's fun in the offices and welfare department of the store. Dancing and singing took place in the clubroom, where addresses on salesmanship, &c., are regularly given for the benefit of the employees and lunch was served in the billiard and men's clubrooms.

These features in a retail Hardware store created much comment, as well as Mr. Lariviere's example in sharing profits with and taking an interest in his employees.

Arrangements for Next Convention.

Two business meetings were held during the stay in Montreal, the most important business done being the arrangements made for the fifth annual convention of the association, to be held at London, Ont., the second week in February next. An exhibit hall has been secured and space will be provided for about 40 exhibits. A committee was also appointed to bring in a report on uniform work sheets for tinner's, lien notes for selling Stoves, &c., the committee to report at the convention. A resolution of thanks to the Montreal Hardware jobbers and manufacturers were also adopted, and on motion Fred C. Lariviere, Montreal, was made an honorary life member in the association.

On the return trip a presentation was made to the association secretary, Weston Wrigley, editor of *Hardware and Metal*, for having successfully carried out all the arrangements for the excursion, an address being given to him along with a sea lion club bag and a suit case of similar material. Many valuable souvenirs were also distributed by various manufacturers. Montreal has invited the Ontario Association to repeat the excursion in 1910, but a short trip to Muskoka may be arranged for next year with a trip to the Soo or back to Montreal in 1911.

New England Iron and Hardware Association's Fall Outing.

THE annual fall outing of the New England Iron & Hardware Association will be held at the Tedesco Country Club, Swampscott, Wednesday, September 15. The members and guests whom they invite will assemble at the club early in the afternoon, and conveyances will leave the club house at 9 p. m., connecting with trains to Boston. During the afternoon a golf tournament will be held for which several cups have been donated and at that time the Association Cup, which was won last year by H. L. Doten, will be played for again, as it must be won three times by the same person in order to secure permanent ownership. President A. B. Marble and the committee have made all arrangements and it is expected that this outing will be even more largely attended and more enjoyable than the one held at the same place two years ago. Dinner will be served at 6 p. m.

The F. A. Godcharles Company.

THE F. A. Godcharles Company, Milton, Pa., is now marketing a full line of Bright Steel Strap and Tee Hinges and Hinge Hasps, in connection with its old and established business of Iron and Steel Cut Nails, Round and Square Flat Plate Washers and Puddle Bars. This new department is fully equipped with up to date machinery, and emphasis is laid on the high quality of the goods thus offered. The company has recently doubled its capacity for manufacturing Square and Round Plate Washers, the former of which will be made a specialty.

In the list of exhibitors at the recent annual convention of the Michigan Retail Hardware Association at Saginaw, given in our issue of the 19th ult., the name of the Saginaw Hardware Company of that city was inadvertently omitted. The company's exhibit occupied two booths and attracted much attention from the members and other visitors.

The Adams & McKee Hardware Company has been incorporated with a capital stock of \$50,000 in Los Angeles, Cal. The company will retail Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Mechanics' Tools, Cutlery, &c.

G. M. Meinertding has succeeded the Tipton Hardware Company, Tipton, Ind.



Be firm; one element of luck
Is genuine solid old Teutonic pluck.

—Oliver Wendell Holmes.

Self-Improvement.

The very reputation of having an ambition to amount to something in the world, of having a grand lift aim, is worth everything. The moment your associates find that you are dead in earnest; that you mean business; that they cannot shake you from your determination to get on in the world, or rob you of your time or persuade you to waste it in frivolous things, you will not only be an inspiring example to them, but the very people who are throwing away their time will also admire your stand, respect it and profit by it, and you will thus be able to protect yourself from a thousand annoyances and time wasters and experiences which would only hinder you.

Example to Others.

In other words, there is everything in declaring yourself, in taking a stand and thereby announcing to the world that you do not propose to be a failure or an ignoramus; that you are going to take no chances on your future; that you are going to prepare yourself for something out of the ordinary, away beyond mediocrity, something large and grand. The moment you do this you stand out in strong contrast from the great mass of people who are throwing away their opportunities, and have not grit and stamina enough to do anything worth while, or to make any great effort to be somebody in the world.

A Strong Contrast.

The very reputation of always trying to improve yourself in every possible way, of seizing every opportunity to fit yourself for something larger, better, grander, is an indication of superiority, and will attract the attention of everybody who knows you. It will win you recommendations for promotion, which are never won by those who make no special effort to get on. Lincoln was so hungry for an education, so anxious to improve himself, that everybody who knew him felt a real interest in him, and was anxious to help him. Most people are eager to help ambitious people who are trying to do something and to be somebody in the world. They throw opportunity and advancement in their way whenever they can. The very reputation of being ambitious—an earnest, thorough worker—is a splendid capital to start out with. It gives confidence and credit. It not only makes people admire you, but it also makes them believe in you.—O. S. Marsden.

Promotion and Help Secured.

The Main Stem.

Eliminate the things that don't count. Put all your strength into the things that do. That's the way to make a real success in any line. In a florist's shop I saw a vase of great shaggy chrysanthemums. My thought flew back a few years to the small and insignificant chrysanthemums we had then, not much bigger than a daisy, but with a great many stems and flowers on one plant. Now, we have bigger ones than were even dreamed of then. It was found that by cutting off some of the branches and forcing all the growth into one stem it would produce a splendid flower worthy of the admiration of all.

Process of Elimination.

Many persons wonder why they don't amount to more than they do. They know they have good stuff in them, that they are sincere, energetic, persevering, and have ample opportunities. But they feel that they are not making satisfactory headway in any particular line. Let them trim some of the useless branches. The men who have made the real successes have done so, and have thrown the whole force of their lives into the development of things that were essential to the kind of success they desired. They have not prided themselves on the number, but on the quality of their branches. They have not dissipated their time by taking part in every by-play that claimed their attention, but have cultivated the main stem.—W. D. Warren.

Developing Essentials.

Saving Time.

Time saving, which means the intelligent use of time, is undoubtedly one of the great factors of success in any walk of life; and that is why inventive genius is kept busy devising means to multiply the values of a day. Anything that enables a man to do more with less effort saves time and energy, and permits him to undertake much that was impossible before. The steam engine, the telegraph, the telephone, the automobile, the electric motor, the typewriter, the perfected printing press, &c., are time savers that in 50 years have done more toward the development of civilization and the increase of the world's wealth than had been accomplished in 1000 years of effort before these economists of time were introduced. Whatever saves time increases convenience and limits the waste of mental or physical energy, adds to the money making power of the world and becomes a business necessity. And as new inventions are put upon the market, new needs arise and new methods must be introduced to utilize them.—F. W. Shumaker.

Big Factor in Success.

Pointers on Business-Building.

Be your own competitor.

A clean and orderly store is the cheapest advertisement a merchant ever had.

Muscular strength is gained by exercise. Mental and moral strength is gained by the same process.

You can't plant pigweed and harvest corn. Nor can you, in merchandising, sow indolence and reap success.

Your opinions carry weight to just the degree that you are able to understand and appreciate the opposite opinion.

When you reach that part of the trip where you really know yourself and are proud of the acquaintance, you will have arrived.

The time has come when, in even inconspicuous places, the inefficient storekeeper must make way for the efficient merchant.

As much energy as you spend in watching your competitor's business, just so much less will you have for pushing your own. And there are men who are going to take your chances away from you, unless you use them so effectively that they cannot.


If you are filling your field and growing with it—then, all is well—but hike ye and keep on hiking, lest another more fit crowd you out.

Retail mail order houses are wise enough not to try to combat the merchant's strong points—they simply take advantage of his weak ones.—Glenwood S. Buck.

Blotters as an Advertising Medium.

THE Schroeter Bros. Hardware Company, 717-719 Washington avenue, St. Louis, Mo., has prepared a set of blotters for advertising its business, several of which are shown herewith. The blotters are $3\frac{1}{4} \times 6\frac{1}{2}$ in. in size, white enameled on the side containing the printing, the reverse being a blotting surface of light pink. The advertising relates to season goods, which are il-

lustrated, accompanied by entertaining printed matter calculated to catch and hold the attention of recipients. The goods thus treated include Water Coolers, Lawn Tennis Sets, Garden Hose, Electric Fans, Baseball Outfits, Lawn Swings, Ice Cream Freezers and Fishing Outfits. The last three are reproduced, reduced in size, as typical of the entire set.



A Reliable Revolver, \$5.25

Of course, we've revolvers for more and others even for less, but for ordinary household use this is O. K.

It's a .32 calibre, double action, automatic ejector, 5 shots, 2-inch barrel, nickel finish with rubber butt plates . . . \$5.25

Shannon Hardware
816 Chestnut

A Household Utility.



A garden vacation

is more beneficial to a woman who works out of doors among her flowers than if she went to the shore and spent most of her time in her dressing-room.

Here are some garden tools that build muscles:

Garden Spades, light, strong and long, \$10.
Garden Rakes, tooth deep and tough, \$10.
Lawn Rakes, won't tear up grass roots, \$10.
Grass Shears, for shearing the lawn, \$10.
Hoes that will hold their edges, \$10.
Green Weeds, double back, perfectly balanced, \$10.
Garden Trimmers, light and strong, \$10.
Garden Set, spade, rake and hoe, \$10.
Galvanized Water Pots, the best ever made, cylinder and cone to one quart, 4 qt., 6 qt., 8 qt., 10 qt., 12 qt., etc.
Lawn Mowers from \$2.50 up.

Shannon Hardware
816 Chestnut

An Inexpensive Vacation.



Anybody Can Paint

a door, stain a floor or varnish up old furniture if the colors are blended properly and of the right consistency. And at small cost, too.

We have all the desirable colors, ready mixed for use, half-pint cans, 15c.

Varnish stains, all colors, half pint, 25c.

Furniture Varnish, half-pint, 25c.

Brushes, 5c. to 50c.

Make your bath tub clean and healthful by giving it a generous coat of Hard Enamel Paint. Half-pint, white, 25c.

Write for Paint Catalogue


Shannon Hardware
816 Chestnut

An Amateur Artist.

lustrated, accompanied by entertaining printed matter calculated to catch and hold the attention of recipients. The goods thus treated include Water Coolers, Lawn Tennis Sets, Garden Hose, Electric Fans, Baseball Outfits, Lawn Swings, Ice Cream Freezers and Fishing Outfits. The last three are reproduced, reduced in size, as typical of the entire set.

The J. B. Shannon Hardware Company, 816 Chestnut street, Philadelphia, Pa., is also using blotters as a medium of publicity. The blotters, $3\frac{1}{4} \times 6\frac{1}{4}$ in. in size,

KING BEE SWING.



\$7.50 Each.

SCHROETER'S

WOULDN'T A KING BEE a chump to buy!

rope to make a swing when he can get our

KING BEE SWING

and be the real article.

Why should you not a KING BEE.


717 - 719 WASHINGTON AVENUE.

That Swinging Habit.

Dumb Waiters, Bathroom Fixtures, Pocket Flashlights, Lock Sets, Door Checks, Casters and Cordage.

A WALL HANGER recently issued by the Marlin Firearms Company, New Haven, Conn., is entitled "Quail Shooting in England." It is a reproduction of a painting by Percival Rosseau, a sportsman artist of international fame. The hanger shows a bevy of quail rising over a knoll, the hunter with gun at shoulder and eye just finding the bird along the top of the barrel. But the real interest centers in two thoroughbred dogs which, in characteristic attitude and with tense, strained muscles, are holding the point until they may be released by the shot. A copy of the hanger will be sent by the company upon receipt of 6 cents in stamps.

THE NORTHERN HARDWARE COMPANY, successor to the Brackett Hardware Company, Petoskey, Mich., has been sold by the owner, G. R. Cottrell, to F. B. Clark, Mt. Pleasant, Mich. The company does a wholesale and retail business in general Hardware, Plumbing, Heating and Sheet Metal Goods, and also carries a line of Mill Supplies, Lumbering Tools and Brass Goods.



ARE YOU GOING FISHING?

YES!!


OFCOURSE YOU LOST LAST YEARS' TACKLE AND NEED A NEW OUTFIT.

We do not claim the largest stock in town, but we have what's wanted and which will help you make up a good story of the fish you caught.

COME AND SEE US.

717 - 719 WASHINGTON AVENUE.

Summer Recreation.



WONDER? WHY SHOULD YOU.

Still, you would wonder at our statement, when we say that our WONDER ICE CREAM FREEZER, FREEZES CREAM IN 4 MINUTES.

A one quart is just the size for a family of five, If we've made a mistake in the size of your family, suppose you try a larger one.

SCHROETER'S

717 - 719 WASHINGTON AVENUE.

Ice Cream Capacity of the Family.

The System Bug.

A Time Clock Episode.

BY WESTMOUNT.

SKILLETT BROS., INC., was one of the eldest jobbing houses in the Middle West and enjoyed the reputation among its employees of being an honest, conservative institution, and if anything a little better than the average in the way it treated its clerks. Old Joshua Skillett, the eldest and sole survivor of the three original Skilletts, had founded the business forty-seven years ago, and in spite of the fact that he was a pretty old man had up till a few weeks before our story opens retained the active management of the business. Although a hard, aggressive business man, he had his own ideas of such new fangled contrivances as time clocks, and stoutly maintained that he got as much work out of his staff by trusting his men as he could by keeping an eye on them by the help of any mechanical watchman.

"If the boys are ten minutes late once in a while," he would say, "they more than make it up in overtime work in the busy season."

"Old Joshua" is Succeeded by "Young Joshua."

By this it might seem that old Joshua was easy, but this was far from the case. There was no room for lag-guards on his payrolls, and the boys realized that fact, and, although they had to work hard to hold their positions, were very fond of the "old man," and most of them would have been perfectly contented to go on working for him for the rest of their lives. This, however, was not to be. A sudden attack of apoplexy carried "old Joshua" off one night to join his brothers in the "great beyond," and a few days later the managerial chair was being occupied by a slim young dandy in fashionable clothes and silk hosiery. This was "young Joshua." He had the same firm chin and mouth and the same aggressive blue eyes as the "old man," but so far his business career had consisted mostly of spending a generous allowance. True he had taken up a "business course" after he left college and felt quite capable of running the business as well, if not better, than his father. At the very moment we meet him he was engaged in working out a system that would be more in keeping with his ideas of how business should be done in this enlightened age.

Time Clock Causes a Stir.

"No time clock! Good heavens, what could father have been thinking about to neglect such a necessity?"

The result was a time clock and a notice to the staff that "all employees of this company must register four times daily," and "any employee failing to conform will be liable to instant dismissal."

This departure from the old regime was not received very favorably by the members of the staff; the office employees in particular were extremely indignant at what they looked upon as a lack of confidence on the part of the "new boss." There was so much grumbling in fact that some of the office staff decided to hold a meeting after 6 p. m. to discuss the matter.

When they did get together, however, nobody seemed to have any suggestions to make as to the best course to pursue, and after a lot of threatening and wrangling it was agreed to accept the inevitable and swallow pride. This was due to the arguments of the head bookkeeper, who, on account of being the senior member of the office staff, felt that it was up to him to try and restrain the ardor of some of the young chaps, although personally he felt just as badly over the matter as anybody.

"What's the use of raising all this fuss, boys? You can't make the boss change his mind and you're liable to lose your job if you kick too much."

"Besides, it doesn't make a great deal of difference to any of us. We have to be here at 8.30 anyway, clock or no clock, and if it pleases the boss to have us punch our time, why not let the matter go at that? He is a 'system fiend,' but he'll get over most of that when he

gets down to real work. Anyway, all the other houses in town use a time clock, so if you quit here you won't be any better off in the end."

This ended the matter and things went along all right until the end of the month, when there was generally some overtime to be put in in order to get the accounts out on time.

For three nights running the clerks in the office were back until midnight. The result was that they were pretty well tired out and most of them were five or ten minutes late every morning. On pay day, upon opening his envelope, every clerk found a notice to the effect that he was so many hours or minutes late and that in future all time lost in this way would be deducted from his salary.

Another Indignation Meeting.

That evening after 6 o'clock there was another indignation meeting in the office. This time the bookkeeper found it impossible to talk the boys into dropping the matter. Harry Waring, the young advertising manager, had the floor and the attention of the boys, so the bookkeeper went home and left them to fight it out and get fired if they wanted to.

They talked the matter over long and earnestly, and finally Waring said:

"Boys, I know my plan will work, although I haven't got it all thought out yet, but if you'll agree to leave the whole matter in my hands I'll guarantee that two months from to-day the office staff won't be docked for any time it loses. * * *

Harry Waring is Fired.

"Mr. Waring, I've spoken to you several times about getting down here on time in the morning and I don't intend to speak much more. That gun catalogue is already far behind its time and, unless you show a little more interest in your work, you'll have to go."

"The catalogue, Mr. Skillett, is being pushed along as fast as the printers can turn it out, and the time I get down in the morning has nothing whatever to do with its being late. Besides, you're docking me for the time I lose, so I fail to see where you have anything to say if I chose to cut down my salary."

"I have a whole lot to say, Mr. Waring, about what time my employees will come to work and, dock or no dock, I want you here at 8.30 sharp every morning. I've stood too much from you already and I want to know right now whether you intend to get here on time or not?"

"I'll do the best I can, Mr. Skillett, but I won't promise anything. I don't get down late intentionally. I'll do my best, but I can't promise."

"All right, Waring, I see that you and I will never get along together in this firm, and, as I have no intentions of vacating to oblige you, you had better see the cashier and get what you're owed. You may have suited my father, but I intend to change things around here, and unquestionable obedience is one thing I must and will have from my employees. You may go." * * *

The Boss's Troubles Begin.

About two weeks after Waring had been discharged Mr. Skillett's troubles began in earnest. In the first place all the other jobbers had their sporting goods catalogues out, and, although Waring's contract with the printers called for his to be finished within the next week, "young Joshua" saw no prospect of its being delivered. Nor could he hold the printers responsible, because the contract had certain conditions in it that protected them. They agreed to deliver the catalogue on a certain date providing all proofs were returned to them within 24 hours, from the time they were sent to the firm. Also there was to be no delay in giving them copy and electros. "Young Joshua" had broken both these conditions, because he couldn't help himself.

He appealed to Brooks, the bookkeeper, but that worthy could advise him no better than to send for Waring and ask him to come back and straighten things out.

Mr. Skillett didn't relish humbling himself before any man, but he began to realize he was wrong and was man enough to swallow his pride.

Waring was not at all surprised when he received a letter asking him to call and see Mr. Skillett as soon as possible. In fact, he had been looking for it even earlier, and admired "young Joshua's" gameness in holding out as long as he did. * * *

A Call for Help.

"Now, Waring, no doubt you're wondering why I sent for you, so I'll come to the point at once. I've been thinking over the little argument we had the day you left and I've come to the conclusion that maybe I was a little hot-headed and hasty in discharging you for nothing, I might say. I've been making inquiries about you and found, with the exception of punctuality, that there has never been any cause to complain about the manner in which you have carried out your duties. The advertising you have done for the firm compares favorably with that of any of our competitors, and our catalogues have been, if anything, better than theirs. I'm trying to get things into shape here and have made up my mind to offer you your position back if you care to take it. What do you say?"

"I'm very much obliged to you, Mr. Skillett, but I don't see my way clear to accept your offer. As you yourself said, there's not room for both of us in this firm, and I'm liable to be discharged again the first morning I happen to get in a few minutes late."

"I don't think I'm an unreasonable man, Waring. I realize that there are times occasionally when any man is liable to be late. I don't object to that, but you know yourself that your record for two months before you left was very bad. There were not more than two or three days out of that time on which you were here at 8.30 in the morning. However, we needn't discuss that at present. There'll be plenty time to fix up that part if you see your way clear to accept my offer of your old position."

"Personally I like you, Waring, and I'd far rather have you back here than a new man. You've been here for quite a number of years and know the work thoroughly, and I might even see my way clear to let you have a little more money. I've made a mistake, Waring, and I'm willing to do anything in reason to make up for it. I'll even go so far as to acknowledge that I need you and need you badly. We're tied up badly with the catalogue and every day it's delayed we're losing money. Let bygones be bygones. Get your coat off and straighten matters out."

Waring's Confession.

"I'd like nothing better, Mr. Skillett, but I have a confession to make first. If after you hear it you still want me, I'll come willingly, and you needn't bother about any more money."

"I feel heartily ashamed of myself for the way I've acted, but I was kind of sore on you when I made my plans. In the first place when I am working on a catalogue I have to put in a lot of night work; in fact when the proofs start to come in I frequently have to work all night in order not to hold the printers up. About the time you landed your time clock scheme on us I'd been doing a lot of this sort of thing. I was about played out and could hardly crawl out of bed in the mornings. Naturally I was always late. I didn't think anything of coming late, however, for your father, when he was here, understood how things were. I intended to tell you about it, but when you started to "dock" me for being late I thought you were going too far. That sort of thing is all right for factory hands who are paid by the hour, but it's not fair for clerks and office men who have to do a lot of overtime. We were working overtime at night for nothing and then getting docked for coming in a little late in the morning. I talked the matter over with the boys, and we figured that as soon as you realized we were human beings with brains and an interest in our work, instead of merely numbers on a pay sheet, things would be all right. The condition the catalogue was in and the short time left in which to get it out gave me an idea. You could replace the office hands in a day and at any other time you could easily have filled my position, but I knew that nobody but myself could possibly get the catalogue out in time to be of any use,

because I alone know what was done and where things were. By letting you discharge me, I knew that you would soon find out that it takes more than one man to run a business like this, and as soon as you discovered that you needed me here you would be more ready to listen to what I had to say."

"Now that I've gained my point, however, I don't feel so elated as I thought I would, I'm heartily ashamed of myself and the mean trick I played on you. I don't deserve or expect my position back now that you know the circumstances of the case, but I'm willing to finish up your catalogue for you free of charge just to ease my conscience."

A Few Things to Learn.

"Well, I'll be hanged! That's certainly one on me, and, although I agree with you, Waring, in saying it wasn't exactly an honorable thing for you to do, maybe it's a good lesson for both of us. I acknowledge that I did imagine I knew how to run a business, but it seems I have yet a few things to learn. Get the catalogue out on time, Waring, and I'll forgive you this time, but in future if you have any grievances against the way things are run come up and talk it over like a man. In the meantime I'll think over this time clock business."

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of new catalogues, price-lists, etc., for our Catalogue Department and for notice in this column.

WIRE GOODS COMPANY, Worcester, Mass.: Display Suggestions No. 2. The company refers to its first booklet of Display Suggestions published in January, 1908, as having increased the sales of merchants who followed them. Most of the displays in the 1909 booklet were made by the company's customers, who furnished photographs of them. Twelve window displays are shown; 15 inside displays, enlarged views of panels, and a number of fixtures suitable for displaying Wire Goods.

WAGNER MFG. COMPANY, Sidney Ohio.: Catalogue illustrating high grade polished Iron Hollow Ware, Nickel Plated Hollow Ware, Cast Aluminum Cooking Utensils, Letters and Numbers, Pokers, Waffle Irons, Stove Lids, Coal Grates, Gas Burners, Sugar Kettles, Hog Scalders, Boiler and Feed Cookers; Furnace Tops, Grates, Doors and Frame; Fruit and Lard Presses, Feed Troughs, Bob Sled Runners and Soles, Mauls, Tugere Irons, Hitching Posts and Weights, Cistern Covers, Sewer and Ditch Grates, Street and Gutter Crossings, Porch Supports, Iron Bases for columns, Light Ventilator Grates, Cast Iron Water Conductors, Star Anchors and Cast Iron Washers.

M. C. HENLEY, Richmond, Ind.: Folder devoted to the advantages of the Henley Roller Skates, with spring steel foot plates conforming to the shape of the foot; flexible tension having the requisite lateral motion, allowing quick and easy turns.

VICTOR MFG. COMPANY, Leavenworth, Kan.: Illustrated catalogue devoted to the Wonder Washer, which has features peculiar to this machine, made for hand or motor power; Ironing Boards, Wonder Wringers, Self-Heating Sad Irons, &c.

GRAHAM NUT COMPANY, Pittsburgh, Pa.: Catalogue No. 6 devoted to Nuts, Washers, Machine and Carriage Bolts, Coach and Lag Screws, Blank Bolts, Bolt Ends, Tap and Stud Bolts, Studs, Coupling Bolts, Rivets, Turnbuckles, Track Bolts, &c. A number of pages are given to tables of weights and proportions, telegraphic code, &c. The book is interleaved with cross ruled pages. The company's Bolt plant, completed over a year ago, is in full operation and is equipped with the latest improved machinery.

NATIONAL FILE & TOOL COMPANY, 2110 Allegheny avenue, Philadelphia, Pa.: Catalogue relating to the Vixen Patent Hand Milling Tools. Illustrations are given of Standard and Special Hand Milling Tools, Surface Holders, Horseshoe Rasps, Saw Tools and Automobile Milling Tools.

Death of Henry Berkele.

HENRY BERKELE died September 4 at his residence in New York City, in his sixty-eighth year, having been for some time broken in health. He was well and very favorably known for many excellent qualities in the Hardware trade, with which he had been identified as salesman and proprietor all his business life. At the beginning of the Civil War he, in company with a number of young men associates, enlisted as volunteers, occasioned by the sudden suggestion of one of the number on an evening when they had met according to custom, and acting at once applied at a nearby recruiting office and were soon in the service. Mr. Berkele was mustered in as a volunteer in the Seventy-first New York Regiment and was in the first Bull Run battle. Some time afterward he was sunstruck, but continued in the army with the commissary department until the close of the war.

Mr. Berkele traveled first for the American Fish Hook Company, leaving it to go with the old house of Merwin, Hurlburt & Co., then in Chambers street, New York, for whom he traveled several years. The firm of Alford, Berkele & Co. was then formed, and when Mr. Alford severed his connection with the business it was continued under the name of Berkele & Davenport. Mr. Davenport subsequently withdrew and Mr. Berkele continued under his own name.

Mr. Berkele as a traveling salesman covered much of the United States and Canada and won an excellent reputation. Of late years Mr. Berkele as selling agent had represented the Geneva Cutlery Company, Geneva, N. Y., and W. A. Busse & Co., Chicago, Ill., with an office in New York City. He was a fine type of man, thoroughly trustworthy and dependable, and one who will be sincerely mourned by many business and social friends and acquaintances. He was a member of the Masonic order and leaves one daughter, his wife having died nearly four years ago.

The Standard Folding Steel Wire Mat.

The Standard Wire Company, New Castle, Pa., is manufacturing a folding wire mat, both sides of which are exactly alike, smooth and soft to the tread. The mat is a little more than $\frac{1}{4}$ in. thick, weighing only 12-3 lb. to the square foot, and is referred to as being soft as a carpet, yielding and pleasant to the foot and always retaining its shape. Being low, it will allow of the opening and closing of a door having a threshold, and people are not likely to trip over it. By the use of the mat every particle of mud, snow or ice, it is said, can be effectually and quickly removed from shoes, also that the texture permits all deposits to fall through and disappear from sight; that cigar ends, wood shavings, peanut shells, &c., are readily pulverized and drop through the meshes out of sight, which is a valuable consideration in public buildings, street cars, steamships, soda fountains, bars, &c. The mat can be readily folded into a compact and neat package, and being light weight, is easily carried. Mats are made in 10 sizes, from 16 x 24 to 36 x 72 in., and each mat is folded, wrapped and labeled, making them convenient for the trade to handle.

The Vac-Jac Cooker.

A fireless cooker recently perfected and put on the market by the Vacuum Utilities Company, 600 Carroll avenue, Chicago, depends entirely upon vacuum for its insulating qualities. The value of vacuum as a nonconductor is well known, but to produce it in metal vessels of any considerable size has been difficult of accomplishment owing to the heavy air pressure sustained. In order to meet this condition, the cooker is made in cylindrical form, with a vacuum space between the inner and outer cases. It is constructed of heavy galvanized steel, and the seams instead of being soldered are welded together by an oxy-acetylene flame. The use of vacuum as a means of insulation does away with absorbent linings, such as felt, cloth, hay, sawdust or other material, and the

cooker, in addition to being absolutely sanitary, is as easily cleaned as any kitchen utensil. The cooker is $13\frac{1}{2}$ in. in diameter and $18\frac{1}{2}$ in. high, and contains one 8 quart, two 3-quart and one 2-quart quadrupled enameled steel vessels, making a total cooking capacity of 16 quarts. It is finished in dark blue enamel and has an



The Vac-Jac Cooker Depending Entirely Upon Vacuum for Its Insulating Qualities.

air tight lid which retains all odors as well as the heat. It is stated that water brought to a boil on an ordinary stove and placed in the cooker will be too hot to drink in 12 hr.

The Ideal Hardwood Floor Scraper.

T. L. Phillips, Aurora, Ill., is manufacturing the scraper shown herewith, which is referred to as being especially adopted to scraping hardwood floors. The arrangement of parts is such that the scraper is firm and rigid, does its work with rapidity and eliminates, it is claimed, the wavy appearance to the finished floor. The device is equipped with rubber tires, and the blades are claimed to be of the best material for the purpose. It is only necessary to slightly turn a single bolt in order to firmly clamp the blade in place. The blades furnished with the machine possess a large amount of real wearing surface and can easily be sharpened without removing from the clamp. The construction is alluded to as being very simple, its operation easy, and it is practically impossible to get it out of repair by use.



The Ideal Hardwood Floor Scraper, the Blade of Which Can Be Sharpened Without Removing from the Clamp.

The Wagner Leader Barn Door Hanger.

The Wagner Mfg. Company, Cedar Falls, Iowa, is putting on the market the barn door hanger shown herewith. As illustrated in Fig. 1, the track is tubular in form, made of No. 14 gauge steel, with a slot on under side, and

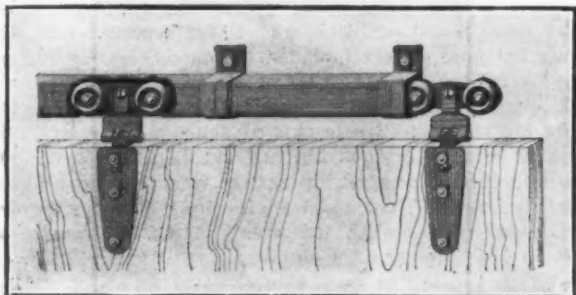


Fig. 1.—Wagner Leader Barn Door Hanger.—Heavy Malleable Hanger and Roller Bearings.

held in place by brackets. Caps are provided for the ends of the track to make it water proof and bird proof. The track is furnished in 3 and 6 ft. lengths. The hanger bars are heavy, made of malleable iron, and the wheels are provided with roller bearings. Fig. 2 shows the comparatively small friction surface, and the adjustable and flexible features, the adjustment to or from the building

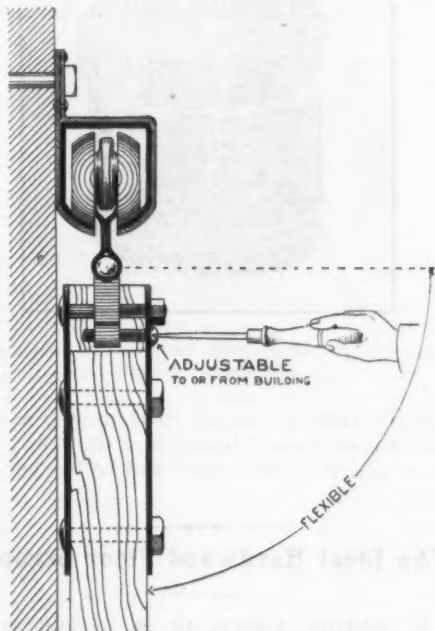


Fig. 2.—Wagner Leader Barn Door Hanger, Showing Adjustable and Flexible Features.

being made with a screw driver. Attention is directed to the wide tread wheels and to the fact that the hanger is easy running and noiseless. The hangers are packed one pair in a box, with bolts and caps for the end of the track, six pairs in a wooden box; weight per dozen pairs boxed, 90 lb. The weight of the track is 2 lb. per foot.

New Rotatable Cowl Ventilator.

A new cowl ventilator made by the Standard Ventilator Company, Lewisburg, Pa., is shown herewith. The device consists of an ordinary collar and a pin upon which a rounded conical hood with a flare opening on one side swings freely. The capacity of the opening, which is always away from the weather like a weather vane, corresponds with the size of the flue. It is designed to utilize down currents of air against it to force horizontal currents of air to issue from the chimney or smokestack with which it is connected, with the effect of increasing the draft. The parts and bearings are constructed so as not to be affected by storms, and the sensitive bearings minimize friction so that it turns easily and is not affected either by heat or cold and re-

quires no oil or grease. When attached to the troublesome stack or chimney any wind force bearing upon it

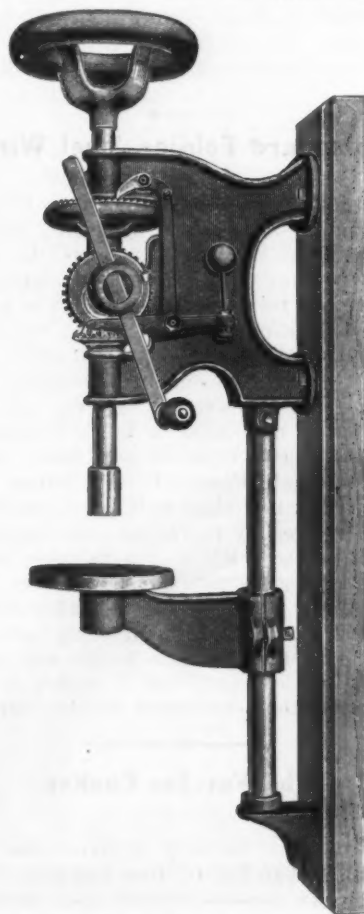


New Rotatable Cowl Ventilator, Designed to Utilize Down Currents for Increasing the Draft.

has the effect of increasing the direct draft. Constructed with an opening which cannot be affected by storms and which permits the entrance of light, it has the advantage when used as a ventilator, of lighting the apartment which it ventilates.

The Noyes Post Drill No. 10.

The new No. 10 drill manufactured by B. B. Noyes & Co., Greenfield, Mass., is shown in the accompanying illustration. The tool is designed especially for use in garage or repair shop. The capacity is 1 in.; it is made to receive $\frac{1}{2}$ in. and 41-64 in. shank drills. It drills to the center of a 15-in. circle, the turned and polished



The Noyes Post Drill No. 10, Designed Especially for Use in Garage or Repair Shop.

table being 7 in. in diameter and having a vertical adjustment of 12 in. The feed is automatic, the turn of a thumbscrew giving four changes of feed. The feed has a run of 4 in. A heavy 10-in. balance wheel is regularly furnished, but the machine will be equipped with a 15-in. wheel if desired. Cut gears are employed in the mechanism to insure easy running. The finish is a maroon enamel.

The E-Z Combination Truck and Bag Holder.

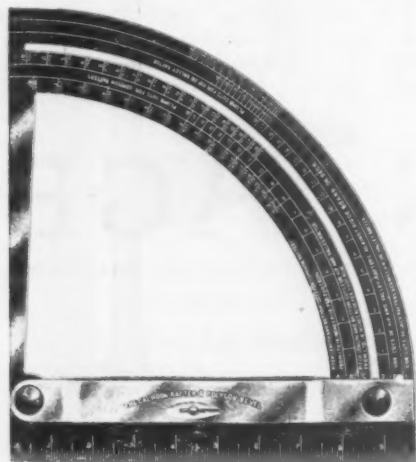
The E-Z Grain Bag Holder Company, Marinette, Wis., is offering the combination truck and bag holder shown herewith. The holder is 16 in. wide—the width of an ordinary half bushel measure—and 5 in. high at the back, to prevent grain or whatever is poured into the bag being spilled out behind. Bags are held securely by pulling down small clamps on each side of the holder and are instantly released by raising the clamps. The clamps are fastened or unfastened by a single motion of the hands, and an experienced man is said to be able to sack as much grain in a day as he could with some one holding the bags for him. The holding rack is malleable iron, and the holder can be raised or lowered to suit bags of different length, or lifted off entirely by removing cross handle, which gives a handy truck for moving filled bags, boxes, barrels, &c. The truck is built strong enough to carry 500 lb. The standard is made of 4 x 1½ in. planed hardwood, neatly varnished. The wheels are 8 in. in diameter and the truck is 41 in. high. The nose or platform at the bottom is made of heavy boiler plate, 12 in. wide, firmly bolted to the standard. The truck when crated weighs about 25 lb.



The E-Z Combination Truck and Bag Holder.

The Calhoon Rafter and Polygon Bevel.

The framing tool, shown herewith, manufactured by A. O. Calhoon & Co., Perry, Mo., is particularly adapted to cutting rafters. It is arranged with graduations on both sides of the arcs, or dial plate, which are automatically found and read at a glance by swinging the pivoted handle with set screw. The device practically



The Calhoon Rafter and Polygon Bevel, Embracing a Square, Tri-Square, Bevel Square, Bevel Protractor, Plumb and Level.

combines six tools which are essential to a carpenter's complete kit. It embraces a square, tri-square, bevel square, plumb, level and bevel protractor, all in one. It is a compact tool and there is nothing to attach or detach to make it complete for use. On the right hand end of the tool, above the swinging arm, are letters from A to F, inclusive. The graduations upon the arc A give the pitch, length and bottom cuts for common rafters from

1 to 18 in. rise per foot run, the rise number appearing above the horizontal line. The graduated arc B is for determining plumb cuts for common rafters, while C indicates the graduations to determine the pitch, length and bottom cuts of hip and valley rafters from 1 to 18 in. rise per foot run. The graduations on D are for securing plumb cuts for these latter rafters; E for the side cuts of hip and valley rafters for contact against the ridge board, or deck, and F for securing the side cuts for jack rafters intended to contact against hip or valley rafters. On the other side, graduations give: G, side cuts of jack rafters intended to rest against octagon hip rafters; H, side cuts of octagon hip rafters; I, plumb cuts for octagon hip rafters; J, pitch length and bottom cuts of octagon hip rafters from 1 to 18 in. rise per foot run; K, polygonal angles desired in framing or building work, and L indicates the degree from 1 to 90, in the segment of a circle.

Fine Mechanics' Tools.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, which is constantly adding to an already large line of mechanics' fine tools, is offering those shown herewith. Fig. 1 illustrates a group of toolmakers' buttons, with screws and washers for jig work, No. 494. The buttons are hardened and ground to standard size, .400 x ½ in., and are used to locate holes to be chucked and bushed for jigs where positive accuracy is required. In use the jig piece is laid out, prick punched,

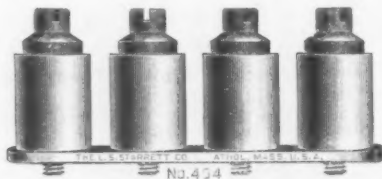


Fig. 1.—Toolmakers' Buttons with Screws and Washers for Jig Work.

drilled and tapped for button screws, smoothing off the burr raised by tapping. The buttons are then fastened on, the pieces strapped to an angle iron and placed on a surface plate, where, by the use of a surface gauge, height gauge or other instruments, the buttons (with holes larger than the screws), are brought to the desired location. The angle iron with button pieces is then strapped to the lathe face plate, bringing one of the buttons to run true with the center, aided by a test gauge. This accomplished, the button is removed and the hole is chucked and reamed. The same procedure is repeated with the remaining buttons, until all the holes are chucked. The buttons are furnished screwed to a small plate, which serves as a convenient holder for them when

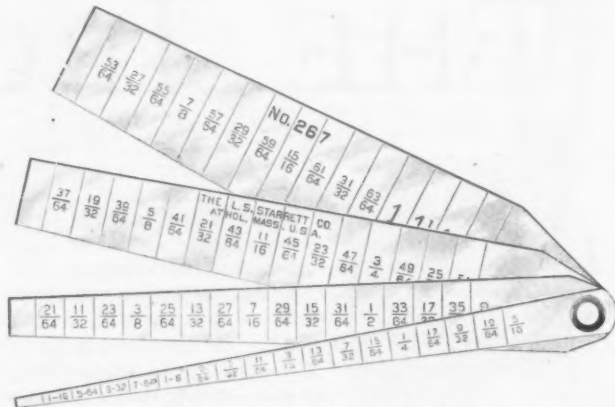


Fig. 2.—New Taper Gauge, No. 267.

not in use. Fig. 2 reproduces the new taper gauge, No. 267. The thin leaves are tapering, the width varying by 1-64 in. to every ¼ in. of length. They are graduated in ¼ in. and figured to read in fractions of an inch from 1-16 in. up to 1 1-16 in. The gauge is designed for brass and steel tube manufacturers and other users for inside

measurements. It is likewise convenient for mechanics with which to measure the width of slots and size of holes in nuts drilled for tapping. Another service is



Fig. 3.—Telescoping Inside Gauge, No. 229.

for setting calipers to sizes within its capacity. The gauge is furnished in both plain and nickel finishes. Fig. 3 is a view of the telescoping inside gauge, No. 229.

These are instruments from which the exact size of holes or slots may be taken by an outside caliper or micrometer, so that shrink and close or loose fits varying in thousandths or less may be made and measured. The tool is used by compressing the telescoping head and locking the plunger by a slight turn of the knurled screw in the end of the handle, then inserting the head inside the hole, when by releasing the lock the plunger will expand across the hole to a fit. The next operation is to lock the plunger by a slight turn of the screw, withdraw and caliper over the ends of the head with a micrometer, which will give the exact size of the hole. The ends of each telescope head are hardened and are made on a radius of the smallest hole it will enter. These instruments are recommended by the company as more reliable than ordinary leg calipers on account of the tendency of caliper legs to spring and of the points to catch in blowholes or other depressions. They also serve a useful purpose in fitting cylinders to holes or holes to cylinders. The gauges are made to enter holes from $\frac{1}{2}$ to 6 in., the capacities being 229 A from $\frac{1}{2}$ to $\frac{3}{4}$ in.; 229 B, $\frac{3}{4}$ to $1\frac{1}{4}$ in.; 229 C, $1\frac{1}{4}$ to $2\frac{1}{4}$ in.; 229 D, $2\frac{1}{4}$ to $3\frac{1}{2}$ in., and 229 E, $3\frac{1}{2}$ to 6 in.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—		China Clay, Imported.		Blue, Ultramarine.....		Black Drop, English.....	
Linseed, Western, Raw.....	56 @57	100 lb 11.50@18.00		Brown, Vandyke.....	11 @14	Black, Ivory.....	16 @20
State, Raw.....	56 @57	Cobalt, Oxide.....	100 lb 1.45@2.60	Green, Chrome.....	12 @16	Lamp, commercial.....	3 @5
City, Raw.....	57 @58	Whiting, Commercial.....	100 lb 45@50	Green, Paris.....	12 @24	Blue, Celestial.....	4 @6
Boiled, 1¢ gal, advance on Raw.	75 @	Gilders.....	100 lb 52@.64	Sienna, Raw.....	12 @15	Blue, Chinese.....	30 @31
Raw, Calcutta, in bbls.....	75 @	Ex. Gilders.....	100 lb 56@.68	Sienna, Burnt.....	12 @15	Blue, Prussian, Domestic.....	28 @30
Lard, Prime Winter.....	92 @95	Putty, Commercial— 100 lb		Umber, Raw.....	11 @14	Blue, Ultramarine.....	5 @15
Extra No. 1.....	97 @98	In bladders.....	\$1.70@2.00	Umber, Burnt.....	11 @14	Brown, Spanish.....	1 @1
No. 1.....	48 @50	In bbls. or tubs, 100 lb.....	1.20@1.45	White and Red, Lead &c.—		Carmine, No. 40.....	2.65@2.75
Cotton-seed, Crude, f.o.b. mill.....	54 @55	In 1 lb to 5 lb tins.....	2.65@3.25	Lead, English white, in Oil—10% @10%		Green, Chrome, ordinary.....	3 @5
Summer, Yellow, prime.....	54 @55	In 12½ to 50 lb tins.....	1.50@1.90	500 lb kegs.....	6%	Green, Chrome, pure.....	17 @25
Summer, White.....	54 @55	Spirits Turpentine— 100 lb		Lead, American White:		Metallic Paint. 100 lb	
Yellow, Winter.....	54 @55	In Oil bbls.....	59 @59½	Dry and in Oil, 100, 250 and		Brown.....	\$16.50@22.00
Tallow, Acidless.....	57 @58	In Machine bbls.....	59½ @60	500 lb kegs.....	6%	Red.....	\$14.00@18.00
Menhaden, Brown, Strained.....	32 @33	Glue— 100 lb		Dry and in Oil, 25 and 50		Ocher, American.....	10 @15.00
Northern, Crude.....	22 @23	Cabinet.....	12 @15	lb kegs.....	7%	American Golden.....	4 @5
Southern.....	23 @23½	Common Bone.....	7½ @9	Dry and in Oil, 12½ lb kegs.....	7%	French.....	14 @2
Light Strained.....	32 @33	Extra White.....	18 @21	In Oil, 25 lb tin pails.....	7%	Foreign Golden.....	3 @1
Bleached Winter.....	36 @	Fish, liquid, 50 gal. bbls. per gal.	60 @1.20	In Oil, 12½ lb tin pails.....	7%	Orange Mineral, English.....	10 @12
Extra Bleached Winter.....	38 @	Ion.....	60 @1.20	In Oil, 1, 2, 3 and 5 lb tin		French.....	12½ @13
Cocunut, Ceylon.....	7½ @7½	Foot Stock, White.....	12 @14	cans, ass't.....	8%	German.....	12 @13
Cod, Domestic, Prime.....	38 @	Foot Stock, Brown.....	9 @11	Red Lead and Litharge:		American.....	8½ @19
Newfoundland.....	40 @	German Common Hide.....	10 @12	In 100 lb kegs.....	7%	Red, Indian, English.....	5 @7
Red Elaine.....	43 @47	German Hide.....	12 @18	In 25 and 50 lb kegs.....	7%	American.....	3 @24
Saponified.....	10 @54 @64	French.....	10 @40	In 12½ lb kegs.....	7%	Red, Turkey, English.....	4 @10
Olive, Yellow.....	1.35@1.40	Irish.....	13 @16	In lots of less than 500 lbs.		Red, Tuscan, English.....	7 @10
Nutsfoot, Prime.....	55 @56	Low Grade.....	10 @12	½ c @ 10¢ advance over		Red, Venetian, Amer.....	100 lb \$1.75@1.50
Palm, Lagos.....	57 @6	Medium White.....	14 @19	above prices of White and		English.....	100 lb \$1.15@1.20
Mineral Oils—		Gum Shellac— 100 lb		Red Lead and Litharge.		Sienna, Italian, Burnt and	
Black, 29 gravity, 25@30 cold	12½ @13	Bleached, Commercial.....	16 @17	Lead, American, Terms: On lots of		Powdered.....	3 @9
test.....	12½ @13	Bone Dry.....	20 @21	500 lbs and over, 60 days, or 2% for		Italian, Raw, Powdered.....	3 @7
29 gravity, 15 cold test.....	13 @13½	Button.....	20 @30	cash if paid in 15 days from date of		American, Raw.....	2½ @3
Summer.....	12 @12½	Diamond.....	26 @	invoice.		American Burnt and Pow'd.....	2½ @3
Cylinder, light filtered.....	20 @20½	Fine Orange.....	20 @21	Zinc, Dry— 100 lb		Talc, French.....	100 lb \$1.00@25.00
Dark, filtered.....	17½ @18	A. C. Garnet.....	18 @18½	American, dry.....	54 @ 54%	American.....	100 lb \$1.00@25.00
Paraffine, 903-907 sp. gravity.....	14 @14½	Light Orange.....	17 @19	Red Seal (French process).....	64 @ 7%	Terra Alba, French.....	100 lb .80@1.2
903 sp. gravity.....	13 @13½	Kala Button.....	13 @15	Green Seal.....	74 @ 7%	English.....	100 lb .90@1.4
883 sp. gravity.....	10½ @11	D. C.....	25 @26	German Red Seal (French		American.....	100 lb .75@.8
Red.....	13 @13½	Octagon B.....	22 @23	process).....	74 @ 7%	American.....	100 lb .75@.8
Miscellaneous—		T. N.....	15½ @16½	Green Seal.....	74 @ 8	Umber, T'key, Bat. & Pow.....	24 @ 3
Barites:		V. S. O.....	24 @25	White Seal.....	84 @ 9	Turkey, Raw and Powdered.....	24 @ 3
White, Foreign.....	100 lb \$18.50@20.50	Colors in Oil— 100 lb		French, Red Seal.....	84 @ 8½	Burnt, American.....	2 @ 2½
Amer., floated.....	100 lb 17.00@18.00	Black, Lampblack.....	12 @14	Green Seal.....	104 @10½	Raw, American.....	2 @ 2½
Off color.....	100 lb 12.50@15.00	Blue, Chinese.....	36 @46	Dry Colors—		Yellow Chrome, Pure.....	12½ @13
Chalk in bulk.....	100 lb 3.00@ 3.40	Blue, Prussian.....	32 @36	Black, Carbon.....	5 @10	Oxide Red, American.....	2 @ 7½
				Black Drop, American.....	3½ @ 8	Vermilion, English, Imported.....	97 @
						Chinese.....	\$0.90@1.00

THE IRON AGE

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Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

North's 10%
Upson's Patent 25%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent 25%
Ives' Stop Head Screws and Washers 25%
Taplin's Perfection 25%

Anti-Rattlers—

Fernald Mfg. Co., Burton Anti-Rattlers, 1/2 doz. pairs, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Anvils—American—

Eagle Anvils 1/2 lb @ 9¢
Hay-Budden, Wrought 1/2 lb @ 9¢
Trenton 1/2 lb @ 9¢

Imported—

Swedish Solid Steel Paragon, 1/2 lb 10¢
Peter Wright & Sons, 1/2 lb, 84 to 349 lb, 10¢; 350 to 600 lb, 11¢.

Anvil, Vice and Drill—

Millers Falls Co., \$18.00 15¢10%

Augers and Bits—

Com. Double Spur 30%
Jennings' Patn., Bright, 65¢10¢10%
Black Lip or Blued 65¢65¢5%
Boring Mach. Augers 70%
Car Bits, 12-in. twist 40¢10%
Ford's Auger and Car Bits 40¢5%
Ft. Washington Auger Co. 35%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list 25¢7%
No. 20, R. Jennings' list 25¢7%
Russell Jennings 25¢10¢2%
Mayhew's Countersink Bits 45%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60¢10%
Snell's Car Bits, 12-in. twist 50%
Snell's King Auger Bits 50%
Snell's Star Auger Bits 50¢10%
Swan's Auger Bits 65¢10¢7%
Swan's Jennings' Pattern 50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Ford's, Clark's Pattern 66%
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, \$12.00; large size, \$26.00 60¢10%
Swan's 60%

Gimlet Bits—

Common Dbl. Cut \$3.00@3.25
German Pattern, Nos. 1 to 10, \$4.75; 11 to 13, \$5.25

Hollow Augers—

Bonney Pat., per doz. \$5.50@6.00
Ames 20¢10%
Universal 20%

Ship Augers and Bits—

Ship Augers 40¢10¢50%
Ford's 33%
C. E. Jennings & Co.:
I. Hommedieu's 6%
Watrons' 33%
Snell's 50%

Awls—

Elmore Tool Mfg. Co.:
Timners' and Brad Awls 55¢7%
Scratch Awls 60%

Axes—

Single Bit, base weights: Per doz.
First Quality \$4.75@5.00
Second Quality \$4.25@4.50
Double Bit, base weights:
First Quality \$7.00@7.50
Second Quality \$6.50@6.75

Axles—

Iron or Steel.

Concord, Loose Collar 4¢1/4¢
Concord, Solid Collar 4¢5¢
No. 1 Common, Loose 3¢1/4¢
No. 1 1/2 Com., New Style 4¢1/4¢
No. 2 Solid Collar 4¢1/4¢
Half Patent:
Nos. 7, 8, 11 and 12 70%
Nos. 13 to 15 70%
Nos. 15 to 18 70¢10¢70¢10¢5%
Nos. 19 to 22 70¢10¢70¢10¢5%

Boxes, Axles—

Common and Concord, not turned 1/2 lb, 5¢6¢
Common and Concord, turned, 1/2 lb, 6¢7¢
Half Patent 1/2 lb, 9¢10¢

Bait—

Fishing—

Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait 20¢5%

Balances—

Sash—

Caldwell new list 50¢10%
Pullman 50¢10%

Spring—

Light Spring Balances, 50¢10¢60%
Chatillon's:
Light Spg. Balances 50¢10¢60%
Straight Balances 40¢10¢50%
Circular Balances 50¢10¢60%
Large Dial 30¢50¢10%

Barb Wire—See Wire, Barb.

Bars—

Crow—

Steel Crowbars, 10 to 40 lb. ... per lb., 2¢1/4¢—¢

Prying and Pinch—

Elmore Tool Mfg. Co. 75%

Towel—

No. 10 Ideal, Nickel Plate, 1/2 gro, \$3.50

Beams, Scale—

Scale Beams 40¢10¢10%
Chatillon's No. 1 30%
Chatillon's No. 2 40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered 1/2 doz. \$3.80;
Tinned \$4.30;
No. 11 Wire Coppered 1/2 doz. \$1.15;
Tinned \$1.29;
No. 10 Wire Tinned 1/2 doz. \$1.50

Beaters Egg—

Dover Stamping & Mfg. Co.:
Genuine Beater, per gro. No. 1, Tumbler Size, \$7.50; No. 2, Family Size, \$7.50; No. 3, Extra Family Size, \$24.00; No. 4, Hotel Size, \$30.00.

Holt-Lyon Co.:
No. 5, Jap'd, \$9.80;
No. A, Jap'd, \$1.15; No. B, Jap'd, \$1.85; No. 6, Jap'd, \$1.65;
Lyon, Jap'd, per doz., No. 2, \$1.35.

Taplin Mfg. Co.:
Improved Dover, per gro. No. 60, \$4.90; No. 75, \$6.50; No. 100, \$7.00;
No. 102, Tin'd, \$8.50; No. 150, Hotel, \$15.00; No. 152, Hotel Tin'd, \$17.00; No. 200, Tumbler, \$8.50; No. 202, Tumbler Tin'd, \$9.50; No. 300, Mammoth, per doz., \$25.00.

Bellows—

Blacksmith Standard List:
Split Leather 60¢60¢10%
Grain Leather 50¢50¢10%

Hand—

Inch. 6 7 8 9 10
Doz. \$1.50 5.50 6.00 7.00 7.50

Molders—

Inch. 10 12 14 16
Doz. \$3.50 11.00 13.50 14.50

Bells— Cow—

Wrought Cow Bells 75%
Jersey 75¢10%
Texes Star 50%

Door—

Reading Hardware Co. 50%
Home, R. & E. Mfg. Co.'s 55¢4%

Hand—

Polished, Brass 60¢60¢10%
White Metal 60¢60¢10%
Nickel Plated 50¢10%
Swiss 50¢10%

Miscellaneous—

Farm Bells 1/2 lb, 2¢1/4¢3¢
Church and School 60¢60¢5%

Belting— Leather—

First Quality, Ex. Hy., Strictly Short Lap 60¢10%
Standard 70¢10¢70¢10¢5%
Light Double 75¢10%
Cut Leather Lacing 45¢50%
Leather Lacing Sides, per sq. ft. 1.25¢

Rubber—

Competition (Low Grade) 70¢10¢75%
Standard 60¢10¢70%
Best Grades 50¢50¢10%

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1909 list:
Chain, Parts, Spokes 50%
Tubes 60%

Blocks Tackle—

Common Wooden 75¢75¢10%
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined, 50¢10¢60%
Embossed 50¢10¢60%

Bobs, Plumb—

Keuffel & Esser Co. 33%10%

Bolts

Carriage, Machine, &c.,—
Common Carriage (cut thread):
1/4 x 6 and smaller 75%
Larger and longer 70%
Common Carriage (rolled thread):
1/4 x 5, smaller and shorter, 75¢5%
Phila. Eagle, \$3.00 list. 80¢—
Bolt Ends, with C. & T. Nuts, 70%
Machine (Cut Thread):
1/4 x 4 and smaller 75¢5%
Larger and longer 70¢5%

Door and Shutter—

Wrought Iron:
Wrought Barrel Japanned, 80¢10¢10¢85%
Barrel Bronzed 60¢10¢70%
Spring 70¢10¢10¢80%
Square Neck 75¢10¢80%
Square 80¢80¢10%

Ives' Mortise Door 25%
Ives' Wrought Door 25%

Expansion—

F. H. Evans' Crescent 40¢60%
Richards Mfg. Co. 25¢10%
Star Expansion Bolt Co.:
Star, Lag Screw Type, 60¢10¢5¢2¢1/2%
Star, Wood Screw Type 40%

Star, Machine, Single Wedge 60%
Star, Machine, Double Wedge, 60¢10%
Star Toggle Bolts 60%
Steward & Romain Mfg. Co.:
Style No. 13, Double 60¢10%
Style No. 1, Single 60¢10%
Style No. 100, Dbl. Jaw, Single, 55%
Lag Screw 60%
Star Screw Anchors, Hollow 40%

Plow and Stove—

Cages, Bird—

Hendryx Brass Series 3000, 5000,
1100, net list; 1200, 15%; 200, 300,
300, 400, 500, 600, 700, 800,
Hendryx Bronze Series 700, 800,
Hendryx Enameled.....35%

Calks, Toe and Heel—

Blunt, 1 prong, per 100 lb.,
\$3.50 @ \$3.85
Sharp, 1 prong, per 100 lb.,
\$4.00 @ \$4.35

Burke's, 1 pg. Blunt Toe, 3 1/2 c; 2 pg.
Blunt Toe, 4 1/2 c; 1 pg. Sharp Toe,
1 1/2 c; 2 pg. Sharp Toe, 1 1/2 c; Blunt
Heel, 4 1/2 c; Sharp Heel, 4 1/2 c;
Perkins', Blunt, 1/2 lb, 3.65 c; Sharp,
4.15 c

Caps—Primers—

Berdan Primers, \$2 per M. 20 1/2 c
Primer Shells and Bullets, 15 c 10
All other primers per M. \$1.32 @ 1.60

Cartridges—

Blank Cartridges:
32 C. P., \$5.50.....10 1/2 c
38 C. P., \$7.00.....10 1/2 c
22 cal. Rim, \$1.50.....10 1/2 c
22 cal. Rim, \$2.75.....10 1/2 c
B. B. Caps, Con. Bull, Swed. \$1.00
B. B. Caps, Round Bull.....\$1.10
Central Fire.....25
Target and Sporting Rifle, 15 1/2 c
Primer Shells and Bullets, 15 c 10
Rim Fire, Sporting.....50
Rim Fire, Military.....15 1/2 c

Castors—

Red.....65 c 10 @ 70 c
Plate.....60 c 10 @ 65 c
Philadelphia.....70 c 10 @ 75 c
Gem (Roller Bearing).....10 1/2 c
Steel Gem (Roller Bearing).....45
Standard Ball Bearing.....45
Yale (Double Wheel) low list.....40 c 10

Chain, Proof Coil—

American Coil Straight Link:
3 1/2 3 1/2 5 1/2 3 1/2 3 1/2 3 1/2
\$7.15 4.80 3.85 3.25 3.10 3.00
5/8-1 1 1/2 to 1 1/4 inch.
\$2.90 3.00
German Coil.....70 1/2 c
German Pattern Coil:
6-0 to 1.....70 1/2 c 10 1/2 c
2 and 3.....60 c 10 1/2 c @ 70 c
4, 5 and 6.....50 c 10 1/2 c @ 10 1/2 c

Halter—

Halter Chains.....60 c 10 @ 60 1/2 c
German Pattern Halter Chains,
list July 25, '97.....70 1/2 c
Covert Mfg. Co.:
Halter.....30 c 10 @ 10 c

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6 1/2-6 3/4, Straight, with ring, \$26.00
6 1/2-6 3/4, Straight, with ring, \$27.00
6 1/2-8 1/2, Straight, with ring, \$30.00
6 1/2-10 1/2, Straight, with ring, \$33.00
NOTE—Add 2c per pair for Hooks
Twist Traces: add per pair for Nos. 2
and 3, 2c; No. 1, 3c; No. 4, 4c to price of
Straight Link.
Eastern Standard Traces, Wag-
on Chain, &c.....70 c 10 @ 10 c

Miscellaneous—

Jack Chain:
Iron.....60 c 10 @ 10 1/2 c
Brass.....60 c 10 @ 10 1/2 c
Safety and Plumbers' Chain, 75 c
Gal. Pump Chain.....10 c 1/2 @ 1/2 c
Bridgeport Chain Co.:
Triumph Halter and Coil, 35 c 10 @ 40 c
Triumph Dog.....50 c 10 @ 60 c
Brown Halter and Coil.....45 c 10 @ 50 c
Covert Mfg. Co.:
Drast, Halter, Heel, Rein, Stal-
hon, Post.....30 c 10 @ 10 c
Oneida Community:
American Halter, Dog and Kennel
Chain.....35 c 10 @ 40 c
Niagara Dog Leads and Kennel
Chain.....45 c 10 @ 50 c
Wire Goods Co.:
Dog Chain.....70 c
Universal Dbl.-Jointed Chain.....50 c 10

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60 c
Pulman:
Bronze Chain, 60%; Steel Chain,
Coppered.....60 c 10 @ 60 c
Sash Chain Attachments, per set, 88 c
Aluminum Sash Ribbon, per 100
ft.....\$2.00 @ \$3.00
Sash Ribbon Attachments, per set, 8 c

Chalk—

Carpenters' Blue.....50 c 10 @ 55 c
Carpenters' Red.....50 c 10 @ 55 c
Carpenters' White.....40 c 10 @ 45 c

Checks, Door—

Hardsley's.....45 c
Reading, Osden.....20 c 1/2
Pullman, per gro.....\$4.00
Russwin.....25 c

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55 c
Youths' Chests, with Tools.....40 c
Gentlemen's Chests, with Tools.....30 c
Farmers', Carpenters', etc., Chests,
with Tools.....20 c
Machinists' and Pipe Fitters'
Chests, Empty.....15 c
Tool Cabinets.....15 c
C. E. Jennings & Co.'s Machinists'
Tool Chests.....7 1/2 c

Chisels—

Socket Framing and Firmer
Standard List.....80 c 10 @ 80 c 10 1/2 c
Buck Bros.....30 c
C. E. Jennings & Co.:
Socket Firmer No. 10.....25 c 1/2
Socket Framing No. 15.....25 c 1/2
R. & E. Mfg. Co.....70 c 10 @ 70 c
Swan's.....30 c 10 @ 30 c
L. & I. J. White & Co.....30 c 10 @ 30 c

Tanged—

Tanged Firmers.....35 c 10 @ 40 c
Buck Bros.....30 c
C. E. Jennings & Co. Nos. 10, 15, 18, 25
R. & E. Mfg. Co.....25 c 10 @ 30 c
L. & I. J. White & Co.....25 c 10 @ 30 c

Box—

Elmore Tool Mfg. Co.....50 c

Cold—

Cold Chisels, good quality, 13 c 1/2
Cold Chisels, fair quality, 11 c 1/2
Cold Chisels, ordinary.....9 c 10
Elmore Tool Mfg. Co.:
Cold Chisels.....50 c 10 @ 50 c

Chucks—

Almond Drill Chucks.....35 c
Almond Turret Six-Tool Chuck.....45 c
Beach Pat, each \$8.00.....35 c 1/2
Cincinnati Chuck Co.:
Independent 4-Jaw Reversible.....25 c
Jacobs' Drill Chucks.....35 c
Skinner Lathe Chucks:
Independent.....35 c
Universal, Reversible Jaws.....35 c
Universal, Com. Style Jaws.....40 c
Combination, Reversible Jaws.....35 c
Combination, Com. Style Jaws.....40 c
Round Body or Box Body, 2 Chuck
Jaws.....25 c
Geared Scroll Chucks.....25 c
Drill Chucks:
New Model, 25%; Geared Pat-
tern, 25%; Skinner Patent.....25 c
Positive Drive.....40 c
Planer Chucks.....20 c
Standard.....45 c
Drill Press Vises.....35 c
Face Plate Jaws.....35 c
Standard Tool Co.:
Improved Drill Chuck.....45 c
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6,
Scroll Combinations, Nos. 8, 15,
8 1/2.....30 c
Geared Scroll, Nos. 33, 34 and 35, 25 c
Independent Iron, Nos. 18 and 318, 35 c
Independent Steel, No. 64.....25 c
Union Drill, Nos. 000, 00, 100, 101,
102, 103, 104.....25 c
Union Gear Drill.....25 c
Universal, 11, 12, 16, 17, 13, 14, 15, 40 c
Universal No. 42.....35 c
Iron Face Plate Jaws, Nos. 28, 30,
48 and 50.....35 c
Steel Face Plate Jaws, Nos. 70 and
72.....30 c
Westcott Patent Chucks:
Lathe Chucks.....50 c
Little Giant Auxiliary Drill.....50 c
Little Giant Double Grip Drill.....50 c
Little Giant Drill, Improved.....50 c
Oneida Drill.....50 c
Scroll Combination Lathe.....50 c

Clamps—

Carriage Makers', Star, P. S. & W.
Co., Parallel.....50 c 10 @ 50 c
Hammer & Co.:
Adjustable.....20 c 1/2
Carriage Makers' H. P. Screw 40 c 1/2
Myers', Standard and Wenzelmann
Hay Rack.....50 c
Saw Clamps, see Vises, Saw Filers

Cleaners, Drain,

Iwan's Champion, Adjustable.....50 c
Iwan's Champion, Stationary.....40 c 1/2

Cleavers, Butchers—

Foster Bros.....30 c
L. & I. J. White Co.....30 c

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1002 Chicago Horse, each, \$10.75
20th Century Horse, each, \$5.00
Lightning Belt Horse, each, \$15.00
Chicago Belt Horse, each, \$20.00
Stewart's Enclosed Gear Ball
Bearing Horse, each, \$7.50
Stewart's New Model Sheep
Shearing Machine, each, \$12.75
Stewart Enclosed Gear Shear-
ing Machine, No. 8, each, \$9.75

Clips, Axle—

Regular Styles.....80 c 10 @ 10 c

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene,
Racking, Liquor, Bottling,
&c.....75 c
Compression Bibbs.....75 c

Compasses, Dividers, &c.

Ordinary Goods.....75 c 10 @ 75 c 1/2

Conductor Pipe,—

L. C. L. to Dealers:
Gal. Steel. Charcoal. Copper.

Northeastern:
70 c 10 @ 70 c 1/2 50 c 10 1/2
Eastern:
75 c 10 @ 75 c 1/2 50 c 10 1/2
Central:
75 c 10 @ 75 c 1/2 50 c 10 1/2
Northwestern:
75 c 10 @ 75 c 1/2 50 c 10 1/2
Western:
70 c 10 @ 70 c 1/2 50 c 10 1/2
Tennessee:
70 c 10 @ 70 c 1/2 50 c 10 1/2
Southern:
70 c 10 @ 70 c 1/2 50 c 10 1/2
Southwestern:
70 c 10 @ 70 c 1/2 50 c 10 1/2

Terms, 60 days: 2% cash 10 days. Fac-
tory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Galvanized, Lined, side handles,
Gal.....2 3 4 6 8
Each.....\$1.30 1.60 2.00 2.30 3.00
White Enameled, Lined, Side
Handles:
Gal.....3 4 6 8
Each.....\$2.40 2.80 3.50 4.50 5.60
Agate Lined, Side Handles:
Gal.....2 3 4 6 8
Each.....\$3.00 3.10 4.30 5.30 6.60

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair
and heavier, 21 c; lighter than
3 lb. to pair.....23 c

Cord— Sash—

Braided, Drab.....10 lb. 35 c
Braided, White, Com. Nos. 8
to 12, 25 c; No. 7, 25 c; No.
6, 26 c.
Cable Laid Italian, lb., No. 18, 37 c
Italian, lb., A. No. 18, 25 c; B. 25 c
Common India.....10 lb. 15 c 1/2
Cotton Sash Cord, Twisted, 18 c 1/2
Patent Russia.....10 lb. 20 c
Cable Laid Russia.....10 lb. 21 c
India Hemp, Br'd'd.....10 lb. 21 c
India Hemp, Twisted.....10 lb. 15 c 1/2
Patent India, Twisted.....10 lb. 17 c
Edystone Braided, Nos. 8 to 12,
25 c; 7, 26 c; 6, 27 c.
Harmony Cable Laid Italian, Nos. 7
to 10.....10 lb. 23 c
Pulman:
Wire Sash Cord.....10 lb. 13 c
Sash Cord Attachments, per 100, \$2.00
Samson, Nos. 8 to 12:
Braided, 10 lb., Drab Cotton,
55 c; Italian Hemp, 40 c @
50 c; Linen, 65 c; White Cot-
ton, 50 c; Spot Cord.....50 c
Massachusetts, White.....10 lb. 40 c
Massachusetts, Drab.....10 lb. 45 c
Phoenix, White, Nos. 8 to 12.....27 c
Silver Lake, per lb.:
A. Drab, 45 c; A. White, 40 c;
B. Drab, 40 c; B. White, 35 c;
Italian Hemp, 40 c; Linen, 57 c
See also Chain and Ribbon.

Wire, Picture—

Full Length.....90 c @ 10 c
Short Length.....90 c 10 @ 10 c
Hendryx Standard Wire Picture Cord,
90 c 10 @ 10 c
Turner & Stanton Co. Wire Picture
Cord.....90 c 10 @ 10 c

Cradles—

Grain.....50 c

Crayons—

White Round Crayons, Cases, 100
gro., \$9.00, \$8.50, \$9.00 and \$10.00
according to grade.

Zelicker's Lumber:
White and Purple, Indelible.....\$7.50
Blue, Red, Green, Yellow and
Terra Cotta, \$6.50; Black.....\$1.50
Giant Lumber, 5 1/4 in. x 15-16 in.
round, all colors, \$12.00; Indel-
ibles, \$11.00; Blacks.....\$10.00
Genuine Soapstone, Metal Workers',
5 in. x 4 in. Round, \$2.50; 5 in. x
1 1/2 in. Square, \$1.75; 5 in. x 3-1/2 in.
\$2.50; 5 in. x 1 1/2 in. x 3-1/2 in. \$3.30
Suremark, Black, \$2.25; Blue, Red
and Yellow.....\$2.50

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, 30 doz. \$3.50
Star, Eagle, Rogers & Hamilton
and Anchor.....30 doz. \$3.00
Wm. Rogers & Son.....30 doz. \$2.50

Cutters— Glass—

H. H. Mayhew Co.....40 c 10 @ 50 c

Meat and Food—

Enterprise:
Nos. 5 10 12 22 32
Each \$1.75 \$2.50 \$2.25 \$4.50 \$5.25 @ 7 1/2 c
No. 202, \$1.50.....10 c 10 @ 10 c

P. S. & W. Co.:
Ideal.....10 c 10 @ 10 c
Hales.....60 c 1/2
Little Giant.....10 c 10 @ 10 c
Nos. 303 310 312 320 322
\$35.00 \$18.00 \$14.00 \$72.00 \$68.00
New Triumph No. 605, 30 doz. \$24.00
Russwin Food, No. 1, \$21.00; No. 2,
\$27.00; 3, \$42.00.....45 c 10 @ 10 c
\$15.00 \$18.00

Siaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35 c
Corn Graters.....30 c
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.....30 doz. \$3.00
Combined Slaw Cutter and Corn
Grater.....30 doz. \$4.00

Tobacco—

Enterprise.....25 c 10 @ 30 c

Diggers, Post Hole, &c—

Disston's:
Rapid, 30 doz., \$24.00.....25 c
Samson, 30 doz., \$31.00.....25 c
Iwan's Pat. Post Hole and Well
Auger.....40 c
Vaughan Pattern Post Hole Augers,
4 to 9 in., 30 doz.....\$6.25
Perfection Post Hole Diggers, 30
doz.....\$8.25
Split Handle Post Hole Diggers,
30 doz.....\$7.25
Hercules Pattern, 30 doz.....\$8.75
Kohler's, 30 doz., Universal, \$11.00;
Little Giant, \$12.00; Genuine Hec-
cules, \$10.00; Invincible, \$9.00;
Rival, \$8.50; Pioneer, \$7.50
Never-Break Crucible Steel Post
Hole Diggers.....60 c

Dressers Emery Wheel—

Sterling Emery Wheel Dressers.....35 c
Sterling Wheel Dresser Cutters.....35 c

Drills and Drill Stocks—

Blacksmith's Common Drilling
Machines.....\$1.50 @ 1.75
Breast, Millers Falls.....15 c 10
Breast, P. S. & W.....30 c 10
C. & C. Ratchet.....25 c
Reversible Ratchet Die Stocks.....25 c
Forbes Die Stocks.....25 c
Goodell Automatic Drills, 30 c 10 @ 30 c
Millers Falls Automatic Drills
Graves, per doz., Nos. 1, \$1.86;
2, \$8.16
Millers Falls Automatic Drills, 33 c 10 @ 30 c
Noyes Repair Shop Drill No. 10.....20 c
Ratchet, Parquet, No. 10.....40 c
Ratchet, Weston's, Styles C, D and
F.....45 c
Ratchet, Weston's, Style H Im-
proved.....45 c
Ratchet, No. 012.....50 c
Ratchet, Celebrated.....50 c
Ratchet, Whitney's, P. S. & W.....50 c
Star Drill.....50 c 10 @ 50 c
Star Pipe Drills.....50 c 10 @ 50 c
Selco Extension Drills.....40 c 10 @ 50 c
Star Drill Holders.....50 c 10 @ 50 c
Star Drill Points.....50 c 10 @ 50 c

Twist Drills—

Bit Stock.....70 c 10 @ 70 c 1/2
Taper and Straight Shank.....65 c 10 @ 65 c 1/2

Drivers, Screw—

Buck Bros' Screw Driver Bits.....30 c
Disston's Screw Drivers, Handles
and Ferrules.....70 c
Elmore Tool Mfg. Co.:
Hartford.....60 c
Indestructible.....55 c
Standard Neverturn.....60 c
Star.....75 c
Screw Driver Bits.....60 c
Fray's Hol. H'dle Sets, No. 3, \$12.50
Ford's Brace Screw Drivers.....40 c 10
Gay's Double Action Ratchet.....35 c
Goodell's Auto.....65 c 10 @ 65 c
Mayhew's Black Handle.....45 c
Mayhew's Monarch.....45 c
Millers Falls, 30 doz., Nos. 1, \$9.95;
12, \$13.73; 20, \$9.17; 21, \$9.46; 41,
\$13.43; 42, \$17.21.
Swan's:
Nos. 7565 to 7568, 60%; No. 7540
40 c 10 @ 10 c

Eave Trough, Galvanized—

Territory. Gal. Steel. Copper.
Northeastern.....75 c 10 @ 75 c 1/2 50 c 10 1/2
Eastern.....80 c 10 @ 80 c 1/2 50 c 10 1/2
Central.....80 c 10 @ 80 c 1/2 50 c 10 1/2
Northwestern.....80 c 10 @ 80 c 1/2 50 c 10 1/2
Western.....80 c 10 @ 80 c 1/2 50 c 10 1/2
Tennessee.....80 c 10 @ 80 c 1/2 50 c 10 1/2
Southern.....75 c 10 @ 75 c 1/2 50 c 10 1/2
Southwestern.....75 c 10 @ 75 c 1/2 50 c 10 1/2

Terms.—2% for cash. Factory shipments
generally delivered.

Note.—Lower prices are quite general
owing to market irregularities.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel, Galv. O. I. and
Copper.
Sizes 2, 3, 4.....80 c
Sizes 1 1/2, 2 1/2, 3 1/2, 4 1/2, 5, 6.....60 c 10
No. 26.....50 c
No. 24.....50 c
Copper Elbows.....50 c

Emery, Turkish—

	4 to	5 1/2 to
Kege.....lb. 5¢	220	Flour.
1/2 Kege.....lb. 5 1/2¢	5 1/2	3 1/2
1/4 Kege.....lb. 5 1/2¢	6	4
10-lb. cans.....6 1/2¢	7	6
10 in case.....10	10	8
10-lb. cans, less.....10	10	8
Less quantity.....10	10	8

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—

Ford's Auger Bit Extensions.....40¢

Extinguishers—Fire

Royal Mfg. Co. Fire, 1 doz.....\$12.00

Fasteners, Blind—

Upson's Patent.....25¢
Walling's.....50¢
Zimmerman's Jap'd and Galv.....65¢
Bronze and Plated.....50¢

Cord and Weight—

Ives, 1/2 doz., \$1.08.....25¢
Titan, 1/2 doz., \$0.66.....25¢

Corrugated—

Acme Corrugated Fasteners.....70¢

Faucets—

Cork Lined.....50¢
Metallic Key, Leather Lined.....60¢
Red Cedar.....40¢
Petroleum.....40¢

John Sommer's Peerless Tin Key.....40¢
John Sommer's Boss Tin Key.....50¢
John Sommer's Victor Mtl. Key.....50¢
John Sommer's Duplex Metal Key.....60¢
John Sommer's Diamond Lock.....40¢
John Sommer's L.X.L. Cork Lined.....50¢
John Sommer's Reliable Cork Lined.....50¢

John Sommer's Chicago Cork Lined.....60¢
John Sommer's O. K. Cork Lined.....50¢
John Sommer's No Brand, Cedar.....50¢
John Sommer's Perfection, Cedar.....40¢
Self Measuring.....40¢

Enterprise, Self Measuring and Pump, 1/2 doz., \$36.00.....40¢
Lane's, 1/2 doz., \$36.00.....40¢

Files—Domestic—

Best Brands.....70¢
Standard Brands.....75¢
Lower Grade.....75¢
Disston's Superfine.....60¢
Fitchburg.....80¢
Heller Bros.....70¢
Liveright Bros., Gold Medal.....70¢
McCaffrey's American Standard.....60¢
McCaffrey's Swiss Pattern.....45¢
Simonds.....70¢

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103; Special, No. 104.....\$3.75
Fusible Links, No. 96.....50¢
Expansion Bolts, No. 107.....60¢

Grindstone—

Net Prices:
Inch.....15 17 19 21
Per doz.....\$3.00 3.25 3.55 4.00
Peck, Stow & Wilcox Co.:
In.....15 17 19 21 24
\$1.00 4.40 4.75 5.50 6.50.....20¢
Reading Hardware Co.....50¢

Frames—Wood Saw—

White, 8'x1' Bar, per doz.....\$1.00
Red, 8'x1' Bar, per doz.....\$1.00
Red, Dbl. Bracc, per doz.....\$1.40

Freezers, Ice Cream—

Qt.....1 2 3 4 6
Each.....\$1.25 \$1.60 \$1.90 \$2.20 \$2.50

Fuse—Per 1000 Feet.

Hemp.....\$2.75
Cotton.....3.20
Waterproof Sol. Taped.....3.65
Waterproof Dbl. Taped.....4.40
Waterproof Tpl. Taped.....5.15

Gates, Molasses and Oil—

Stebbins' Pattern.....90¢

Gauges—

Marking, Mortise, &c.....50¢
Chapin-Stephens Co.:
Marking, Mortise, &c.....50¢
Disston's Marking, Mortise, &c.....60¢
Wire, Brown & Sharpe's.....35¢
Wire, Morse's.....25¢
Wire, P. S. & W. Co.....25¢

Gimlets—Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, \$2.00; 2, \$2.30
Spike, Metal, No. 1, \$1.00; 2, \$1.30
Nail, Wood Handled, No. 1, \$2.50; 2, \$2.60
Spike, Wood Handled, No. 1, \$1.30; 2, \$1.60

Glasses, Level—

Chapin-Stephens Co.....65¢
Disston & Sons.....60¢

Glue, Liquid Fish—

Bottles or Cans, with Brush, 25¢
25¢ @ 10¢ @ 50¢

Grease, Axle—

Common Grade.....gro. \$6.00 @ \$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, 1/2 doz., 1 lb., \$1.20
2 lb., \$2.00
Helmet Hard Oil.....25¢

Griddles, Soapstone—

Pike Mfg. Co.....33¢ @ 33 1/2¢ @ 10¢

Grinders—

Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).....33 1/2¢
Mower Knife and Tool, \$5.00.....40¢
Royal Mfg. Co.:
Hand Power, each, Nos. 01, \$1.75; 02, \$2.25; 1A, \$2.50; 1B, \$3.25.....33 1/2¢
Foot Power, No. 10, \$5.00.....33 1/2¢
Encased Gears, No. 15, Hand Power, \$13.50; Combined Hand and Foot Power, \$15.00.....33 1/2¢
Lawn Mower Grinder, No. 40.....\$3.75
Sickle Grinder, each, No. 20, \$5.00.....33 1/2¢
Cast or Cut Gears.....33 1/2¢

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, 1/2 inch, 1/2 doz., \$2.00.....23 1/2¢
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40¢

Grips, Nipple—

Perfect Nipple Grips.....40¢ @ 10¢ @ 2¢

Halters and Ties—

Cow Ties.....70¢ @ 10¢ @ —%
Bridgeport Chain Co.:
Triumph Coil and Halters, 35¢ @ 40¢ @ 40¢
Brown Coil and Halters.....45¢ @ 50¢
Brown Cow Ties.....50¢ @ 55¢ @ 10¢ @ 5¢
Brown Tie Outs.....70¢ @ 10¢ @ 75¢ @ 5¢
Covert Mfg. Co.:
Web.....30¢ @ 10¢
Jute Rope.....55¢
Sisal Rope.....15¢
Cotton Rope.....45¢
Hemp Rope.....45¢
Oneida Community:
Am. Coil and Halters.....40¢ @ 40¢ @ 5¢
Am. Cow Ties.....45¢ @ 50¢
Niagara Coil and Halters.....45¢ @ 50¢ @ 5¢
Niagara Cow Ties.....45¢ @ 50¢ @ 10¢ @ 5¢
Hellers' Machinists'.....65¢ @ 10¢ @ 65¢ @ 10¢
Heller's Farriers'.....40¢ @ 10¢ @ 10¢
Peck, Stow & Wilcox Co.:
Crucible Steel.....50¢
Farriers'.....50¢
Riveting.....50¢
Machinists'.....50¢
Blacksmiths'.....50¢
Elmore Shoemakers' Hammers.....75¢
Victor Magnetic Tack, 1/2 doz., \$7.75

Hammers—**Handled Hammers—**

Heller's Machinists'.....65¢ @ 10¢ @ 65¢ @ 10¢
Heller's Farriers'.....40¢ @ 10¢ @ 10¢
Peck, Stow & Wilcox Co.:
Crucible Steel.....50¢
Farriers'.....50¢
Riveting.....50¢
Machinists'.....50¢
Blacksmiths'.....50¢
Elmore Shoemakers' Hammers.....75¢
Victor Magnetic Tack, 1/2 doz., \$7.75

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢.....80¢ @ 10¢
3 to 5 lb., per lb., 40¢.....80¢ @ 10¢ @ 10¢
Over 5 lb., per lb., 30¢.....80¢ @ 10¢ @ 10¢

Handles—

Agricultural Tool Handles
Are, Pick, &c.....60¢ @ 10¢ @ 60¢ @ 10¢
Iloc, Rake, &c.....40¢
Fork, Shovel, Spade, &c.:
Long Handles.....40¢
D Handles.....40¢

Cross-Cut Saw Handles—

Atkins'.....35¢
Disston's Handles and Saw Tabs.....45¢

Mechanics' Tool Handles—

Auger, assorted.....gro. \$3.00 @ \$3.50
Brad Axl.....gro. \$1.65 @ \$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, \$2.40 @ \$2.65; Hickory.....\$2.15 @ \$2.40
Socket Firming, Apple, \$1.75 @ \$1.95; Hickory.....1.60 @ 1.75
Socket Framing, Hickory.....1.60 @ 1.75
File, assorted.....gro. \$1.30 @ \$1.40
Hammer, Hatchet, &c.....60¢ @ 10¢ @ 60¢ @ 10¢
Hand Saw, Varnished, doz., 80¢; 85¢; Not Varnished.....65¢ @ 75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz., 45¢
Chapin-Stephens Co.:
Carving Tool.....30¢ @ 30¢ @ 10¢
File and Axl.....60¢ @ 60¢ @ 10¢
Saw and Plane.....30¢ @ 30¢ @ 10¢
Screw Driver.....30¢ @ 30¢ @ 10¢

Millers Falls Adj. and Ratchet Auger Handles.....15¢ @ 10¢
Nicholson Simplicity File Handle.....\$0.85 @ \$1.50

J. L. Osgood:
Indestructible File and Tool, 1/2 doz., No. 1, \$8.00; No. 2, \$8.50; No. 3, \$9.00; No. 4, \$9.50; No. 5, \$10.00.....gro. lots 10%

W. A. Zelnicker Supply Co.:
Hammer, 1/2 doz., 12 in., \$2.00; 14 in., \$2.00; 16 in., \$2.30; 18 in., \$2.50; 20 in., \$2.70; 22 in., \$3.00; 24 in., \$3.30; 26 in., \$3.50; 30 in., \$3.80
Sledge, 1/2 doz., oval, 30 in., \$3.80; octagon, 30 in., \$3.80; oval, 36 in., \$4.00; octagon, 36 in., \$4.00
Axe, 1/2 doz., 28 to 34 in., \$5.60; 36 in., \$5.80
Adze, 1/2 doz., 36 in., \$5.80; 36 in., \$7.80
Pick, 1/2 doz., R. R., 36 in., \$8.00; coal, 34 in., \$5.80
Hatchet, 1/2 doz., 12 to 14 in., \$2.00

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Chicago Spring Butt Co.:
Friction.....25¢
Oscillating.....25¢
Big Twin.....25¢
Chicago Mfg. Co.:
Baggage Car Door.....50¢
Elevator.....30¢
Railroad.....30¢
Crank & Carrier Mfg. Co.:
Loose Axle.....60¢ @ 10¢
Roller Bearing.....70¢
Griffin Mfg. Co.:
Solid Axle, No. 10, \$12.00, 60¢ @ 10¢
Roller Bearing, No. 11, \$15.00, 60¢ @ 10¢
Roller Bearing, Ex. Hy., No. 22, \$18.00, 60¢ @ 10¢
Bull Dog, \$24.00.....70¢
Lane Bros. Co.:
Parlor, Ball Bearing, \$14.00:
Standard, \$3.15; No. 105, \$2.85; New Model, \$2.80; New Champion per set of 4 Hangers, complete with track.....\$2.25
Barn Door, Standard.....60¢ @ 10¢
Hinged.....\$6.08
Covered.....60¢ @ 5¢
Special.....70¢ @ 5¢
Trolley Hangers and track.....50¢
Lawrence Bros.:
Cleveland.....70¢ @ 7 1/2¢
Clipper, No. 75.....\$10.00
Crown.....\$10.00
Cyclone, No. 40.....\$6.50
Tandem, No. 50.....\$7.50
New York.....55¢ @ 10¢
Trolley, No. 30, 1/2 pair.....\$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2, 70¢
Adjustable Track No. 12, \$2.20
Roller B'g St'l Track No. 13, \$2.50
Roller B'g, Nos. 39, 41, 43, 70¢ @ 7 1/2¢
Horo, Adj. Track No. 19, 50¢ @ 10¢
Adjustable Track Tandem Trolley Track No. 16.....50¢ @ 10¢
Seal, Steel Track No. 8.....\$2.25
Auto Adj. Track No. 22, 50¢ @ 5¢
Trolley B. D., No. 17, \$1.25; P. D., No. 12, \$2.25; No. 127, \$2.45; No. 153.....\$2.50
Safety Underwriters F. D., No. 101.....50¢
Tandem No. 41, 2 1/2 and 3 60¢ @ 10¢
Palace, Adjustable Track No. 132.....50¢ @ 5¢
Royal, Adjustable Track No. 122.....50¢ @ 10¢
Ives' Wood Track No. 1.....\$2.25
Trolley B. D., No. 20.....50¢ @ 10¢
Trolley B. D., No. 24, \$1.30; No. 27, \$1.40; No. 28.....\$1.80
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Chicago Spring Butt Co.:
Friction.....25¢
Oscillating.....25¢
Big Twin.....25¢
Chicago Mfg. Co.:
Baggage Car Door.....50¢
Elevator.....30¢
Railroad.....30¢
Crank & Carrier Mfg. Co.:
Loose Axle.....60¢ @ 10¢
Roller Bearing.....70¢
Griffin Mfg. Co.:
Solid Axle, No. 10, \$12.00, 60¢ @ 10¢
Roller Bearing, No. 11, \$15.00, 60¢ @ 10¢
Roller Bearing, Ex. Hy., No. 22, \$18.00, 60¢ @ 10¢
Bull Dog, \$24.00.....70¢
Lane Bros. Co.:
Parlor, Ball Bearing, \$14.00:
Standard, \$3.15; No. 105, \$2.85; New Model, \$2.80; New Champion per set of 4 Hangers, complete with track.....\$2.25
Barn Door, Standard.....60¢ @ 10¢
Hinged.....\$6.08
Covered.....60¢ @ 5¢
Special.....70¢ @ 5¢
Trolley Hangers and track.....50¢
Lawrence Bros.:
Cleveland.....70¢ @ 7 1/2¢
Clipper, No. 75.....\$10.00
Crown.....\$10.00
Cyclone, No. 4

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers. 30&10%

Hods— Coal—

Mfg'r's list, price per gross:
 Inch 15 16 17 18
 Gale. Open. \$35 \$39 \$42 \$46
 Jap. Open. 26 28 31 35
 Gale. Funnel. 43 48 52 56
 Jap. Funnel. 33 36 39 43

Masons' Etc.

Cleveland Wire Spring Co.:
 Steel Brick, No. 182, each \$1.05
 Steel Mortar, No. 158, each \$1.35

Hoes— Eye—

Scott and Oval Pattern,
 60&10@60&10&10%
 Grub, list Feb. 23, 1899,
 70&10@70&10&10%
 D. & H. Scovill, 27 1/2

Handled—

Cronk's Weeding, No. 1, \$2.00; No. 2, \$2.50
 Star Double Bit, \$2.50

Holders— Bit—

Angular, 1/2 doz, \$24.00, 45&10%

Broom—

Pullman Broom, 1/2 gro, \$9.00

Door—

Bardsley's, Iron, 40%; Brass and
 Bronze 25%
 Empire 25%
 Pullman 25%
 Richards Mfg. Co., No. 117, Ever-
 ready, 40%; Nos. 118, 119, Sure
 Grip 50%
 Superior 40%

File and Tool—

Nicholson File Holders and File
 Handles 33 1/2@40%

Fruit Jar—

Triumph Fruit Jar Holder, 1/2 doz, \$2.00

Nipple—

Curtis Nipple Holders, 5%

Trace and Rein—

Fernald Double Trace Holder, 1/2 doz,
 pairs \$1.25
 Dash Rein Holder, 1/2 doz, \$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swatv.,
 50%; German, 33 1/2%

Hooks—Cast—

Bird Cage, Reading, 50%
 Clothes Line, Reading List, 50&5
 Coat and Hat Iron, Reading, 50%
 Coat and Hat, Bronze Metal, Read-
 ing 33 1/2%
 Coat and Hat, Wrightville, 60&5
 Harness, Reading List, 50%

Wire—

Belt, Nos. 1 to 15, 75&10@80%
 Wire C. & H. Hooks, 80@90&10%
 Parker Wire Goods Co., King, 75&10%
 Wire Goods Co.:
 Acme, 60&10%; Chief, 75@75&10%;
 Crown, 75&10@80%; Czar, 70%; Cap-
 itol, 80%; Czar Harness, 50&10%;
 Ceiling, 75&80%.

Miscellaneous—

Hooks, Bench, see Stops, Bench.
 Rush, Light, doz., \$6.20; Medium,
 \$6.75; Heavy, \$7.65
 Grass, best, all sizes, per doz.,
 \$2.75@3.00
 Grass, common grades, all sizes,
 per doz., \$1.25@1.80
 Hooks and Eyes:
 Brass 60@60&10%
 Malleable Iron 70@70&10%
 Covert Mfg. Co., Gate and Scuttle
 Hooks 25%
 Turner & Stanton Co., Cup and
 Shoulder 85&10%
 Bench Hooks—See Bench Stops.
 Corn Hooks—See Knives, Corn.

Hose, Rubber—

Garden Hose, 1/2-inch:
 Competition ft. 6@6 1/4¢
 3-ply Guaranteed, ft. 8 1/4@9¢
 4-ply Guaranteed, ft. 9 1/4@12¢
 Cotton Garden, 1/2-in. coupled:
 Low Grade, ft. 6 1/2 9¢
 Fair Quality, ft. 10@11 1/4¢

Irons— Sad—

From 1/2 to 10, lb. 2 1/4@2 1/2¢
 Mrs. Port's, cents per set:
 Nos. 50 55 60 65
 Jap'd Caps, 83 88 93
 Tin'd Caps, 91 98 1.01 98

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%;
 Corner 80%

Jacks, Wagons—

Covert Mfg. Co.:
 Auto Screws, 30&10%; Steel, 50%
 Lane's Steel, 30&10%
 Richards' Tiger Steel, No. 131, 50&10%

Ladder—

Richards Mfg. Co., Ladder Jacks, 5%

Jointers—

Pike Mfg. Co., Saw Jointers, \$7.00, 40%

Knives—**Butcher, Kitchen, &c.—**

Foster Bros.' Butcher, &c., 30%

Corn—

Columbian Cutlery Co., Wilcut
 Brand Knives and Hooks, 60%

Drawing—

Standard List, 80&10@—%
 C. E. Jennings & Co., Nos. 15, 46,
 25&7 1/2%
 Jennings & Griffin, Nos. 41, 42,
 60&7 1/2%
 Swan's 66%@70%
 Watrous 16%
 L. & J. J. White, 20&5@23%

Hay and Straw—

Serrated Edge, per doz, \$5.00@5.50
 Iwan's Sickle Edge, 1/2 doz, \$9.00
 Iwan's Serrated, 1/2 doz, \$9.50

Miscellaneous—

Farrier's doz, \$2.60@3.55
 Wostenholm's 1/2 doz, \$3.00@3.25

Knobs—

Base, 2 1/2-inch, Birch or Maple,
 Rubber Tip, gro, \$1.25@1.50
 Door, Mineral, doz, \$3@70¢
 Door, Por. Jap'd, doz, 70¢@75¢
 Door, Por. Nickel, doz, \$2.65@2.15
 Bardsley's Wood Door, Shutters, &c, 15%

Ladders, Store, &c.—

Lane's Store, 25%
 Myers' Noiseless Store Ladders, 50%
 Richards Mfg. Co.:
 Improved Noiseless, No. 112, 50%
 Climax Shelf, No. 113, 50%
 Trolley, No. 109, 50%

Ladles, Melting—

L. & G. Mfg. Co.'s list, Melting and
 Plumbers' 25%
 P. S. & W., 40&10%
 Reading 50&10%

Lamps,—

Hammer's M. I. Hand, 45%

Lanterns—Tubular—

Regular, No. 0, doz, \$1.00@1.50
 Side Light, No. 0, doz, \$1.25@1.75
 Hinge Globe, No. 0, doz, \$1.25@1.75
 Other Styles, 40&5%

Bull's Eye Police—

3-inch \$3.75@4.00

Latches— Thumb—

Roggins' Latches, Jap'd, with
 Screws doz, 35¢@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101,
 1/2 doz, \$2.00
 Richards' Bull Dog, Heavy, No.,
 123 50&5%
 Richards' Trump, No. 127, \$1.50

Leaders, Cattle—

Small, doz, 50¢; large, 60¢
 Covert Mfg. Co.:
 Cotton, 55%; Hemp, 45%; Jute,
 55%; Sisal, 45%.

Lifters, Transom—

Reading, Iron, 50&5%; Bronze
 Metal 33 1/2%
 R. & E., 10%

Lines—

Wire Clothes, Nos. 18 19 20
 100 feet, \$2.30 1.95 1.75
 75 feet, \$1.95 1.65 1.50
 Samson Cordage Works:
 Solid Braided Chalk, Nos. 0 to 3, 40%
 Solid Braided Masons', 30%
 Silver Lake Braided Chalk, No. 0,
 \$6.00; No. 1, \$5.50; No. 2, \$7.00; No.
 3, \$7.50, gr, 30%
 Masons' Lines, Shade Cord, &c.,
 White Cotton, No. 3 1/2, \$1.50; No. 4,
 \$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2,
 \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75;
 Linen, No. 3 1/2, \$2.50; No. 4, \$3.50;
 No. 4 1/2, \$4.50, 30%
 Tent and Awning Lines: No. 5,
 White Cotton, \$7.50; Drab Cotton,
 \$3.50, 30%
 Clothes Lines, White Cotton: 50 ft.,
 \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75
 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75;
 100 ft., \$5.25, 30%

Turner & Stanton Co.:
 Solid Braided Chalk, Masons' and
 Awning Lines, 40%
 Clothes Lines, White Cotton, 40%
 Shade Cord, Cotton or Linen, 30%

Locks— Cabinet—

Cabinet Locks, 33 1/2@32 1/4@3%
Door Locks, Latches, &c—
 NOTE—Net prices are very often made
 on these goods.
 Reading Hardware Co., 33 1/2%
 R. & E. Mfg. Co., 10%

Padlocks—

R. & E. Mfg. Co., Wrought Steel and
 Brass 75&10%

Sash, &c.—

Ives' Patent:
 Crescent 25%
 Automatic Gravity Metal Sash, 3/4
 gro., \$149.58, 25%
 Window Ventilating, 25%
 Pullman Patent Ventilating Lock, 33%
 Reading Sash Locks, Iron, 50%
 Reading Sash Locks, Bronze Metal,
 33 1/2%

Machines—Boring—

Com. Up'r't, without Augers, \$2.00@2.25
 Com. Ang'l'r, without Augers, \$2.25@2.50
 Ford Auger Bit Co., \$22.00
 Jennings, Nos. 1 and 4, 25&7 1/2%
 Millers' Falls, 5.75
 Snell's, Upright, \$2.65; Angular, \$2.90
 Swan's Improved, 40&10%

Corking—

Reisinger Invinible Hand Power,
 1/2 doz, \$48.00

Forming, Bending, Etc—

Royal Forming, Bending, Crimp-
 ing and Fluting, Hand Power,
 each, \$20.00, 40%

Hoisting—

Moore's Anti-Friction Chain Hoist, 30%
 Moore's Hand Hoist, with Lock
 Brake 20%
 Moore's Cyclone High Speed Chain
 Hoist 25%

Ice Cutting—

Chandler's 12 1/2%

Mallets—

Hickory 43&5@50%
 Lignumvite 45&5@50%
 Timmers' Hickory and Apple-
 wood doz, 45¢@50%

Mangers, Stable—

Swett Iron Works, 50%

Mats, Door—

Acme Flexible Steel, 50%
 Elastic Steel (W. G. Co.), new list, 30%
 Everlasting Flexible Steel, 40%

Mills, Coffee, &c.—

Enterprise Mfg. Co.:
 Coffee 20@25%
 Bone, Shell and Corn, 25&10%
 Parker's Columbia and Victoria, 33 1/2%
 Parker's Box and Side, 50&10%
 Swift, Lane Bros. Co., 30%

Motors, Water—

Pike Mfg. Co., Tool and Knife
 Grinding 33 1/2%

Mowers, Lawn—

NOTE—Net prices are generally quoted
 10¢ for each size.
 Cheapest, 10-in., \$2.00; advance
 10¢ for each size.
 Cheap, 10-in., \$2.25; advance 15¢
 20¢ for each size.
 Better Grade, 10-in., \$3.00; ad-
 vance 2 1/2¢ for each size.
 High Grade, 10-in., \$4.75 5.00 5.25
 Continental, High and Low Wheel,
 50&10%
 Great American, 66%
 Great American Ball Bearing, 66%
 Quaker City, 66%
 Pennsylvania, High and Low Wheel,
 50&10%
 Pennsylvania, Jr., Ball Bearing, 50&5%
 Pennsylvania Golf, 6 Knives, Low
 Wheel, 33 1/2%; High Wheel, 45%
 Pennsylvania Golf, Ball Bearing, 7%
 Knives, High Wheel, 33 1/2%
 Pennsylvania Horse, 30 and 38 inch,
 33 1/2%
 Pennsylvania Pony or Two Man, 40&5%
 Pennsylvania Grand Horse, 30 and
 38 in., 33 1/2%

Great American, 66%
 Great American Ball Bearing, 66%
 Quaker City, 66%
 Pennsylvania, High and Low Wheel,
 50&10%
 Pennsylvania, Jr., Ball Bearing, 50&5%
 Pennsylvania Golf, 6 Knives, Low
 Wheel, 33 1/2%; High Wheel, 45%
 Pennsylvania Golf, Ball Bearing, 7%
 Knives, High Wheel, 33 1/2%
 Pennsylvania Horse, 30 and 38 inch,
 33 1/2%
 Pennsylvania Pony or Two Man, 40&5%
 Pennsylvania Grand Horse, 30 and
 38 in., 33 1/2%

Nails—

Wire Nails and Brads, Miscel-
 laneous 85&5@85&10%
 Cut and Wire. See Trade Report.
 Hungarian, Finishing, Upholster-
 ers, &c. See Tacks.

Horse—

Jobbers' Special Brands,
 per lb, 9¢

Picture—

Brass 11d, gro. 1 1/2 2 2 1/2 3 in.
 Por. Head, gro. 1 1/2 2 2 1/2 3 in.

Upholsters—

Brass 30%
 Plated 30&10%

Nuts— Blank or Tapped.

Cold Punched: Off list.
 Square 5.20¢
 Hexagon 5.80¢
 Square, C. T. & R. 5.60¢
 Hexagon, C. T. & R. 6.10¢
 Hot Pressed: Off list.
 Square 5.80¢
 Hexagon 6.10¢

Oakum—

Best lb, 6 1/2¢
 U. S. Navy, 10.6 ¢
 Navy 10.5 ¢
 Plumbers' Spun Oakum, 2 1/2@3 ¢

Oil—

Pike Mfg. Co., Stonoil, 40%

Oil Tanks—See Tanks, Oil.**Oilers—**

Steel, Copper Plated, 75&10%
 Chase or Paragon, 50&10%
 Brass and Copper, 50&10%
 Zinc 65&10@70%
 Railroad 60&10@10%
 American Tube & Stamping Co.:
 Spring Bottom Cans, 70@70&10%
 Railroad Oilers, &c., 60@60&10%
 Hero Fruit Jar Co.:
 Spring Bottom Cans, 70@70&10%
 Railroad Oilers, etc., 60@60&10%
 Malleable, Hammers' Improved, Nos.
 11, 12 and 13, 10%; Old Pattern,
 Nos. 1, 2, 3, 4, 50%.
 Maple City Mfg. Co.:
 Spring Bottom Cans, 70@70&10%
 Railroad Oilers, &c., 60@60&10%

Openers, Can—

Triumph Shear Can Openers, doz, \$1.20

Egg—

Hartigan Nickel Plate, 1/2 doz, \$2.00;
 Silver Plate, \$4.00.

Packing—

Asbestos Packing, Wick and
 Rope, any quantity, 13¢

Rubber—

(Fair quality goods.)
 Sheet, C. I., 11¢@12¢
 Sheet, C. O. S., 11¢@12¢
 Sheet, C. B. S., 12¢@13¢
 Sheet, Pure Gum, 14¢@15¢
 Sheet, Red, 10¢@15¢
 Jenkins' '96, 1/2 lb, 80¢, 25%

Miscellaneous—

American Packing, lb, 7¢@10 ¢
 Cotton Packing, lb, 16¢@25 ¢
 Italian Packing, lb, 9¢@10¢
 Jute lb, 4¢@4 1/4¢
 Russia Packing, lb, 9¢@10¢

Paint—

Dixon's Silica-Graphite, in 1 gal.
 pails and 5 gal. kegs, 25%; pack-
 ages of larger size, 20%

Pans— Dripping—

Standard List, 75&10@80%

Refrigerator, Galva.—

Inch 12 14 16 18
 Per doz, \$1.75 2.25 2.80 3.15

Paper—Building Paper

Asbestos Paper, 10n, \$37.50@40.00
 Roll Board or Building Felt,
 6 to 30 lb, per 100 sq. ft., 3 1/4¢
 Roll Board or Building Felt,
 3-32 and 1/4 in., 45 to 60 lb,
 per 100 sq. ft., 3 1/4¢
 Mill Board, Sheet, 40 x 40 in.,
 1-32 to 1/2 in., 2 1/2¢
 Per roll.
 Rosin Sized Sheathing: 500 sq. ft.
 Light weight, 25 lbs. to roll,
 49¢@58¢
 Medium weight, 30 lbs. to roll,
 56¢@70¢
 Heavy weight, 40 lbs. to roll,
 75¢@78¢
 Black Water Proof Sheathing,
 500 sq. ft., 1 ply, 65¢; 2 ply,
 85¢; 3 ply, \$1.10; 4 ply, \$1.25.
 Deafening Felt, 9, 6 and 1 1/2 sq.
 ft. to lb., ton, \$51.50
 Red Rope Roofing, 250 sq. ft.
 per roll, \$1.75

Tarred Paper—

1 ply, roll 400 sq. ft., ton,
 \$31.00@33.00
 2 ply, roll 108 sq. ft., 65¢
 3 ply, roll 108 sq. ft., 80¢
 Slater's Felt (roll 500 sq. ft.), 80¢

Sand Paper and Cloth—

Flint and Emery, 50¢@10%
 Garnet Paper and Cloth, 25%

Parers—Apple—

Goodell Co.:	
Family Bay State.....	doz. \$15.00
Improved Bay State.....	doz. \$36.00
New Lightning.....	doz. \$7.00
Turn Table.....	doz. \$8.00
White Mountain.....	doz. \$5.00
Bonanza Improved.....	each \$7.50
Dandy.....	each \$10.00
New Century.....	each \$20.00
Ranger.....	each \$25.00
Rapid Apple Slicer.....	each \$100.00
Reading Hardware Co.:	
Advance.....	doz. \$4.00
Baldwin.....	doz. \$4.00
Reading 72.....	doz. \$3.25
Reading 78.....	doz. \$6.25

Orange—

Goodell Co., Success.....	each \$20.00
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Potato—

Saratoga.....	doz. \$7.00
White Mountain.....	doz. \$6.00

Picks and Mattocks—

List.....	75¢ to 100%
Cronk's Handled Garden Mattock.....	doz. \$6.00

Pins, Escutcheon—

Brass.....	50¢ to 50¢ to 100%
Iron.....	60¢ to 60¢ to 100%

Pipe, Cast Iron Soil—

Eastern Prices:	
Standard, 2-6 in.....	68%
Extra Heavy, 2-6 in.....	74%
Fittings, Standard and Heavy.....	80%

Pipe, Merchant—

Carloads to Consumers:	
Steel.....	%
Blk. Galv. Blk. Galv.....	%
1/2 and 1/4 in.....	%
1/2 in.....	%
1/4 in.....	%
5 to 6 in.....	%
7 to 12 in.....	%

Pipe, Vitrified Sewer—

Carload lots.	
Standard Pipe and Fittings, 3 to 2 1/2 in., f.o.b. factory:	
First-class.....	85%
Second-class.....	87%

Pipe, Stove—

Per 100 joints.	
C. L. L. C. L.	
Wheeling Corrugating Co.'s Nested:	
5 in., Uniform Color.....	\$6.90
6 in., Uniform Color.....	7.40
7 in., Uniform Color.....	7.40

Planes and Plane Irons—

Wood Planes—	
Bench, first qual.....	30¢ to 30¢ to 50%
Bench, second qual.....	40¢ to 40¢ to 50%
Molding.....	25¢ to 25¢ to 50%
Chapin-Stephens Co.:	
Bench, First Quality.....	30%
Bench, Second Quality.....	40%
Molding and Miscellaneous.....	25%
Toy and German.....	30%
Union.....	60%

Iron Planes—

Union.....	60%
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Plane Irons—

Wood Bench Plane Irons.....	25%
Buck Bros.....	30%
Chapin-Stephens Co.....	25%
Union.....	20¢ to 25%
L. & J. White.....	20¢ to 25%

Planters, Corn, Hand—

Kohler's Eclipse.....	doz. \$7.50
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Plates—

Feloe.....	lb. 3% to 4%
Avery Stamping Co.:	
Standard Wrot. Steel Feloe Plates in 100 lb. kegs, per 100 lb., 1/4-in. to 1 1/4-in., \$4.00 net; 1 1/4-in. to 2-in., inclusive, \$3.75 net.	

Steel Pipe Hook—

Never-Break.....	75¢ to 100%
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Pliers and Nippers—

Button Pliers.....	75¢ to 75¢ to 100%
Gas Burner, per doz., 5 in., \$1.25 to \$1.50; 6 in., \$1.50 to \$2.00.	
Gas Pipe.....	7 8 10 12-in.
Acme Nippers.....	\$2.00 \$2.25 \$2.75 \$3.50
Cronk & Carrier Mfg. Co.:	
American Button.....	80%
Improved Button.....	75¢ to 100%
Cronk's.....	60%
No. 80 Linemen's.....	50%
Stub's Pattern.....	45%
Combination and others.....	33% to 45%
Elmore Tool Mfg. Co.:	
Gas Pliers.....	70%
Wire and Cutting Pliers.....	75%
Heller's Farriers' Nippers, Pincers and Tools.....	40¢ to 100%

P. S. & W. Timmers' Cutting Nippers.....	20%
Utica Drop Force & Tool Co.:	
Pliers and Nippers, all kinds.....	40%

Plumbs and Levels—

Chapin-Stephens Co.:	
Plumbs and Levels.....	30¢ to 30¢ to 100%
Chapin's Imp. Brass Cor.....	40¢ to 40¢ to 100%
Pocket Levels.....	30¢ to 30¢ to 100%
Extension Sights.....	30¢ to 30¢ to 100%
Machinists' Levels.....	40¢ to 40¢ to 100%
Diston & Sons:	
Shafting Levels.....	60¢ to 100%
Pocket Levels.....	60¢ to 100%
Plumbs and Levels.....	60¢ to 100%
Track Level and Gauge.....	60¢ to 100%
Woods' Extension.....	33%

Points, Glaziers—

Bulk and 1-lb. papers.....	10. 9¢
1/4-lb. papers.....	10. 9¢
1/2-lb. papers.....	10. 10¢

Police Goods—

Manufacturers' Lists.....	25¢ to 25¢ to 50%
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Polish—Metal, Etc—

Ladd Co.:	
Putzade Liquid, 1/2 gro., 1/4 pts., \$12.00; 1 pts., \$20.00; 1 qts., \$40.00; 1 doz., 1/2 gals., \$6.35; 1 gals., \$12.00.	
Prestolite Liquid, No. 1 (1/2 pt.), 1/2 doz., \$3.00; No. 2 (1 qt.), \$5.00; 1 doz., \$12.00.	
George William Hoffman:	
U. S. Metal Polish Paste, 3 oz. boxes, 1/2 doz., \$5.00; 1/2 doz., \$1.50; 1 lb. boxes, 1/2 doz., \$2.25.	
U. S. Liquid, 8 oz. cans, 1/2 doz., \$1.25.	
Barkeepers' Friend Metal Polish, 1/2 doz., \$1.75.	

Stove—

Black Eagle Benzine Paste, 5 lb. cans, 1/2 doz., \$10.00.	
Black Eagle, Liquid, 1/2 pt. cans, 1/2 doz., \$7.50.	
Black Jack Paste, 1/2 lb. cans, 1/2 doz., \$9.00.	
Black Kid Paste, 5 lb. cans, each, \$6.05.	
Ladd's Black Beauty Liquid, per 100 lbs., \$6.75.	
Joseph Dixon, 1/2 gr., \$5.75; 1 lb., \$10.00.	
Dixon's Plumbago.....	1 lb. 8¢
Firestone.....	1 lb. 8¢
Gem, 1/2 gr., \$1.50; 1 lb., \$3.50.	
Japanese.....	1 lb. 8¢
Jet Black.....	1 lb. 8¢
Peerless Iron Enamel, 10 oz. cans, 1/2 doz., \$1.50.	

Window Polish—

Beni. P. Forbes:	
Glasbrite, 1 lb. cans, each.....	75¢
Glasbrite, Factory, 10 lb. pails, 1/2 doz., \$25.00.	

Peppers, Corn—

1 qt. Square.....	doz. \$0.80; gro. \$3.75
1 qt. Round.....	doz. \$0.90; gro. \$10.00
1 1/2 qt. Square.....	doz. \$1.20; gro. \$12.00
2 qt. Square.....	doz. \$1.50; gro. \$15.00

Pots, Glue—

Enameled.....	40%
Tinned.....	50¢ to 100%

Powder—

Black Sporting:	
Kegs (25 lb.).....	\$5.00 to \$5.50
Half Kegs (12 1/2 lb.).....	\$2.75 to \$3.00
Quarter Kegs (6 1/4 lb.).....	\$1.50 to \$1.65
Canisters, pounds.....	.25
Canisters, 1/2 pounds.....	.15
Canisters, 1/4 pounds.....	.12

NOTE.—Prices vary according to territory.

Presses—

Enterprise Mfg. Co., Fruit, Wine and Jelly.....	20¢ to 25%
Lard Presses and Sausage Stuffers.....	25¢ to 25¢ to 75%

Seal Presses—

Morrill's No. 1, 1/2 doz., \$20.00.....	50%
Morrill's Pocket, \$20.00.....	50%

Pruning Hooks and Shears

See Shears.	
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Pullers, Nail, Etc.—

Elmore Tool Mfg. Co.:	
Drop Forged Tack Claws.....	50¢ to 100%
Standard Tack Claws, No. 10.....	33% to 75%
Nail Pullers.....	40%
Miller's Falls, No. 3, 1/2 doz., \$12.00.....	33% to 40%
Morrill's No. 1, Nail Puller, 1/2 doz., \$20.00.....	50%
Pearson Spike Puller, each, \$15.00.....	25%
Parrot Tack and Stub Pullers, 1/2 doz., \$1.20.....	50%
The Scranton Co., Case Lots:	
No. 21 (large).....	\$5.50
No. 3B (small).....	\$5.00

Pulleys, Single Wheel—

Inch.....	1 1/2 2 3
Acwing or Tackle, doz., \$0.50 to \$1.00.	
Hay Fork, Squirrel or Solid Eye, doz., 4 in., \$1.25; 5 in., \$1.55.	
Inch.....	2 2 1/2 3 1/2
Hot House, doz., \$0.65 to \$1.20.	
Inch.....	1 1/2 2 3

Screw, doz.....	\$0.16 .19 .23 .30
Inch.....	1 1/2 2 2 1/2 3
Side, doz.....	\$0.25 .30 .55 .60
Inch.....	1 1/2 2 2 1/2 3

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1 1/2 and 2 in.....	17¢ to 20¢
Auger Mortise, no Face Plate, per doz., 1 1/2 and 2 in.....	20¢ to 21¢
Acme, No. 35, 1 1/2 in., 10¢; 2 in., 20¢.	
American Pulley Co.:	
Wrought Steel American Plain Axle.....	50¢ to 100%
Wrought Steel, Eagle, 1/2 doz., 1 1/2 in., 17¢; 2 in., 20¢.	
Top Notch, Electrically Welded, Nos. 3 and 4, 1/2 doz., 19¢.	
Common Sense, 1/2 doz., 20¢.	
Merit, 1/2 doz., 2 1/2 in., 37¢.	
Fox-All-Steel, Nos. 3 and 7, 2 in.....	50%
Grand Rapids All Steel Noiseless.....	50%
Niagara, No. 25, 1 1/2 in., 19¢; 2 in., 20¢.	
No. 26, Troy, 1 1/2 in., 14¢; 2 in., 16¢.	
No. 28, 1 1/2 in., 19¢; 2 in., 20¢.	
Tackle Blocks—See Blocks.	

Pumps—

Cistern.....	60%
Pitcher Spout.....	75¢ to 10¢ to 80
Wood Pumps, Tubing, etc.....	50%
Barnes Mfg. Co.:	
Dbl. Acting (low list).....	50%
Pitcher Spout.....	80%
Daisy Spray Pump.....	1/2 doz. \$6.50
Goulds Mfg. Co.:	
Double-Acting Thresher Tank.....	\$5.00
Diaphragm No. 3, Side Suction.....	\$14.50
Empire, Advance, Seneca, D. A. Shallow and Deep Well (low list).....	50%
Spraying and Whitewashing.....	\$2.45
F. E. Myers & Bros. (low list):	
Double Acting Force and Lift; Cistern and Well; House; Windmill; Ratchet Handle; Pump Stands; Hydro-Pneumatic; Bulldozer Power; Spray; Ashland Force and Lift.....	50%
Thresher Tank—Myers and Faultless Low Down Tank.....	\$5.00
Century Low Down Tank, No. 470.....	\$5.25
Century Low Down Ratchet Handle Tank, No. R470.....	\$5.50

Pump Attachments—

Chicago Hdw. & Fdy. Pump Spout Attachments, each.....	\$0.27
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Pump Leathers—

Plunger and Valve Leathers—Per gro.: 1 2 3 4	
No.....	\$5.00 6.00 7.00 8.00
Cup Leathers—Per 100:	
Inch.....	2 1/2 3 3 1/2 4
	\$5.00 7.00 9.00 12.00

Punches—

Saddlers' or Drive, good, doz., 50¢ to 75¢.	
Spring, single tube, good quality.....	\$1.75
Revolving (4 tubes).....	doz. \$3.50
Hemis & Call Co.'s Cast St'l Drive.....	50%
Elmore Tool Mfg. Co.:	
Machinists' Center.....	40%
Timmers' Solid, 50%; Prick.....	50%
Morrill's Nos. 1AA, 1A, 1B, 1C.....	50%
1D, \$15.00.....	50%
Hercules, 1 die, each \$5.00.....	50%
Niagara Hollow Punches.....	40%
Niagara Solid Punches.....	55%
Timmers' Hollow, P. S. & W. Co., 25% doz., \$1.45.....	40% to 100%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron, 2 1/2 to 3 1/2 in., 1 lb., 36¢.....	30%
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Sliding Door, Wrought Brass, 1 1/2 in., lb., 36¢.....

30%	
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Cronk's:

Double Braced Steel Rail.....	1/2 ft. 2 1/4
O. N. T. Rail.....	2 1/4

Griffin's:

xxx 100 ft., 1 x 3-16 in., \$3.25; 1 1/4 x 3-16 in., \$3.75.	
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Hinged Hanger, 100 ft., 1 x 3-16 in., \$3.50; 1 1/4 x 3-16 in., \$4.00.**Lawrence Bros.:**

1 x 3-16 in., 100 ft., \$7.50; 1 1/4 x 3-16 in., \$8.75.....	55¢ to 75%
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Trolley, No. 301, 100 ft.....

9¢	
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McKinney's:

Hinged Hanger Track, 100 ft., 1 1/4 in., \$6.00; 1 1/2 in., \$6.50.	
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Myers' Stayon Track.....

60¢ to 100%	
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Richards Mfg. Co.:

Common, 1 x 3-16 in., \$3.00; 1 1/4 x 3-16 in., \$3.25; 1 1/2 x 3-16 in., \$3.50.	
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Special Hinged Hanger Rail.....

40¢ to 100%	
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Lag Screw Rail, No. 65.....

50%	
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Gauge Trolley Track, 100 ft., No. 31, 9¢; No. 32, 11¢; No. 33, 20¢.

No. 50.....	60¢ to 100%
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Nos. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64, \$4.00; 45, \$3.25; 46, \$3.50; 49, No. 1, \$3.25; 49, No. 2, \$3.50.**Rakes—**

Cronk's:	
Steel Garden: Champion, 1/2 doz., 12-tooth, \$3.75; 14-tooth, \$4.00; 16-tooth, \$4.25; Ideal, 1/2 doz., 12-tooth, \$3.00; 14-tooth, \$3.30; 16-tooth, \$3.60.	
Victor, 12-tooth, \$2.25; 14-tooth, \$2.50; 16-tooth, \$2.75.	
Queen City Lawn, 1/2 doz., 20 teeth, \$2.35; 24, \$2.50.	
Anticlog Lawn, 1/2 doz., \$2.50.	
Malleable Garden.....	75¢ to 100%
Ideal Steel Garden, 1/2 doz., 12 teeth, \$15.00; 14, \$16.00; 16, \$18.00.....	80%
Kohler's:	
Jumbo Lawn, 36-tooth.....	doz. \$5.00
Lawn Queen, 20-tooth.....	doz. \$2.65
Lawn Queen, 24-tooth.....	doz. \$2.75
Paragon, 20-tooth.....	doz. \$2.10
Paragon, 24-tooth.....	doz. \$2.50
Steel Garden, 14-tooth.....	doz. \$2.40
Malleable Garden, 11-tooth.....	doz. \$1.75 to 2.00

Rasps, Horse—

Disston's.....	75%
Heller Bros.....	70¢ to 70¢ to 100%
Liveright Bros' Gold Metal.....	70%
McCauley's American Standard.....	60¢ to 100%
New Nicholson.....	70¢ to 100%
See also Files.	

Razors—

W. H. Compton Shear Co.....	30%
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Reels, Fishing—

Hendryx:	
M 6, Q C, A 6, B 6, M 9 1/4, M 16, Q 16, A 16, B 16, 4008, Rubber, Popolo, Nickle Popolo.....	20%
Aluminum, German Silt., Bronze, 1249 N, 124 N.....	20%
3304 N, 124 N, 6 RM, G 9.....	25%
4 N, 6 PN, 24 N, 26 PN.....	30%
2904 P, 33 1/2 P, 2904 PN, 33 1/2 P, 0924 N, 33 1/2 P, 2906 N, 33 1/2 P, 002904 PN, 33 1/2 P, 802 N, 33 1/2 P, 986 PN, 2904 N, 974 PN.....	25%
5009 PN, 5009 N.....	20%
Competitor PN, 202 P, 202 PN, 102 FR, 202 PR.....	20%

Steel, Tarred, Medium Lath
Yarn:
Pure lb. 6¢ @ 7¢
Cotton Rope:
Best, 1/4-in. and larger, 16 1/2 @ 20¢
Medium, 1/4-in. and larger, 15 1/2 @ 16¢
Common, 1/4-in. and larger, 7 1/2 @ 11¢
In coils, 1/2¢ advance.
Jute Rope:
Rare, No. 1, 1/4-in. and up.
lb. 5¢ @ 5 1/2¢

Wire Rope—
Galvanized 47 1/2 @ 52 1/2¢
Plain 55 @ 62 1/2¢

Ropes, Hammock—
Covert Mfg. Co.:
Jute, \$0.75 @ \$0.85; Sisal, \$0.82 @ \$0.90

Rules
Boxwood 60 @ 65¢
Ivory 25 @ 35¢
Chapin-Stephens Co.:
Boxwood 60¢
Flexiford 40¢
Ivory 25 @ 35¢
Miscellaneous 50 @ 55¢
Stephens' Combination 55¢
Stationers' 50 @ 55¢
Kenfelf & Esser Co.:
Folding, Wood 35 @ 40¢
Folding, Steel 33 1/2 @ 40¢
Lufkin's Steel 50 @ 55¢
Lufkin's Lumber 50 @ 55¢
Upon Nut Co.:
Upon Nut Co., Boxwood 60 @ 65¢

Saws—

Atkins':
Circular 45¢
Band 50 @ 55¢
Butcher Saws 50¢
Cross Cuts 40¢
One-Man Cross Cut 40¢
Narrow Cross Cut 50¢
Hand, Rip and Panel 35 @ 40¢
Miter Box and Compass 40¢
Mulay, Mill and Drag 45¢
Wood Saws 40 @ 45¢
Chapin-Stephens Co.:
Turning Saws and Frames, 30 @ 30 & 10%

Disston's:
Circular, Solid and Ins'ted Tooth, 50¢
Band, 2 to 18 in. wide, 60¢
Band, 1/4 to 1 1/2 in. wide, 45¢
Crosscuts 45¢
Narrow Crosscuts 50¢
Mulay, Mill and Drag 40¢
Framed Woodsaws 35¢
Woodsaw Blades 25¢
Woodsaw Rods, Tinned 15¢
Hand Saws, Nos. 12, 99, 9, 16, 1100
D8, 120, 75, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

C. E. Jennings & Co.:
Back Saws 16 1/2 @ 17 1/2¢
Butcher Saws 25 @ 27 1/2¢
Compass and Key Hole 33 1/2 @ 35¢
Framed Wood Saws 25 @ 27 1/2¢
Hand Saws 12 1/2 @ 14¢
Wood Saw Blades 33 1/2 @ 35¢
Millers Falls:
Butcher Saws 15 @ 16¢
Star Saw Blades 15 @ 16¢
Massachusetts Saw Works:
Victor Kitchen Saws 40 @ 45¢
Butcher Saws 35 @ 40¢
Peace & Richardson's Hand Saws, 30¢

Simonds':
Circular Saws 45¢
Crescent Ground Cross Cut Saws, 30¢
One-Man Cross Cut 40¢
Gang Mill, Mulay and Drag Saws, 40¢
Band Saws 50¢
Back Saws 25 @ 27 1/2¢
Butcher Saws 35 @ 37 1/2¢
Hand Saws 25 @ 27 1/2¢
Hand Saws, Bay State Brand, 45¢
Compass, Key Hole, & 25 @ 27 1/2¢
Wood Saws 40 @ 45¢
Wheeler, Madden & Clemon Mfg. Co.'s Cross Cut Saws 50¢

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A, 40%
Disston's:
Concave Blades 25¢
Chromol Blades 35¢
Hack Saw Frames, 30¢
Simonds, 35%; Bay State, 40%:
Culley 35¢
C. E. Jennings & Co.:
Hack Saw Frames, Nos. 175, 180 40 @ 45¢
Hack Saws, Nos. 175, 180, complete, 40 @ 45¢
Goodell's Hack Saw Blades, 40 @ 45¢
Griffin's Hack Saw Frames, 35 @ 40¢
Griffin's Hack Saw Blades, 35 @ 40¢
Griffin Co. Hack Saw Blades, 50%
Star Hack Saws and Blades, 15 @ 16¢
Sterling Hack Saw Blades, 30 @ 35¢
Sterling Hack Saw Frames, 30 @ 35¢
Sterling Power Hack Saw Machines, each, No. 1, \$25.00; No. 2, \$30.00; 10%
Victor Hack Saw Blades, 20¢
Victor Hack Saw Frames, 40¢
Victor Hack Saw Machines, each, \$75.00

Scroll—
Barnes, No. 7, \$15.00, 25¢
Barnes' Scroll Saw Blades, 40¢
Barnes' Velocipede Power Scroll Saw, with boring attachment, \$18.00
with boring attachment, \$20.00
Lester, complete, \$10.00, 15¢
Rogers, complete, \$3.50 and \$4.00, 15 @ 16¢

Scales—

Union Platform, Plain, \$2.10 @ \$2.20
Union Platform, Std., \$2.20 @ \$2.30
Chatillon's:
Eureka 25¢
Favorite 10¢
Grocers' Trip Scales 50¢
Reading Hardware Co. 50 @ 55¢
The Standard Portables 40¢
The Standard R. R. and Wag-

Scrapers—

Chapin-Stephens Co., Box, 30 @ 30 & 10%
Richards Mfg. Co., Foot, 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., \$2.50 @ 2.75; 1 1/4, \$3.00 @ 3.25; 1 1/2, \$3.50 @ 3.75
Bench, Wood, 20 @ 20 1/2¢
Hand, Wood, 70 @ 70 1/2¢
Chapin-Stephens Co., Hand, 70 @ 70 1/2¢

Coach, Lag and Hand Rail—

Lag, Conc Point, 75 @ 10 & 10%
Coach, Gimlet Point, 75 @ 10 & 5%
Hand Rail, 70 @ 10 & 75%

Jack Screws—

Standard List, 70 @ 10 & 75%
Millers Falls, 50 @ 10 & 10%
Sweet Iron Works, 70 @ 75%

Machine—

Cut-Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 50 @ 50 1/2¢
Fuller Head, 40 @ 40 1/2¢
Roll Thread, F. H. or R. H., Iron, 75 @ 10%
F. H. or R. H., Brass, Nos. 8 to 14, 65 @ 10%

Set and Cap—

Set (Iron), 75 @ 10 & 7 1/2%
Set (Steel), not advance over Iron, 25%
Sq. Hd. Cap, 70 @ 10 & 7 1/2%
Hex. Hd. Cap, 70 @ 10 & 7 1/2%
Rd. Hd. Cap, 50 @ 7 1/2%
Fuller Hd. Cap, 60 @ 7 1/2%

Wood—

List July 23, 1903.
Flat Head, Iron, 87 1/2 @ 90¢
Round Head, Iron, 85 @ 90¢
Flat Head, Brass, 80 @ 90¢
Round Head, Brass, 77 1/2 @ 90¢
Flat Head, Bronze, 75 @ 90¢
Round Head, Bronze, 72 1/2 @ 90¢
Drive Screws, 87 1/2 @ 90¢

Scythes— Per doz.

Plain Grass, Cutting Edge Polished, \$6.25 @ \$6.50
Clipper, Bronzed Web, \$6.50 @ \$6.75
Solid Steel, Web and Backs Polished, \$7.00 @ \$7.25
Bush, Weed and Bramble, Painted, \$6.50 @ \$6.75
Grain, Painted, Cutting Edge Polished, \$8.25 @ \$8.50
Clipper Grain, Bronze Web, \$8.50 @ \$8.75

Seeders, Raisin—

Enterprise 25 @ 30%

Sets— Awl and Tool—

Fray's Hollow Tool Handles, Nos. 1, \$12; 2, \$16; 3, \$18, 50%
Millers Falls Ad. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18, 20 @ 10%

Octagon Sets, Nail—

Buck Bros, 27 1/2%
Elmore Tool Mfg. Co., 30%
Mayhew's, \$7.00 @ \$7.50
Snell's Corrugated, Cup Pt., 40 @ 10%
Snell's Knurled, Cup Pt., 40 @ 10%
Victor Knurled, Cup Pt., \$7.50

Rivet—

Regular Hat, 75 @ 75 & 10%

Saw—

Atkins':
Criterion 40¢
Adjustable 40¢
Disston's Star, Monarch and Triumph, 30%
Giant Royal Cross Cut, \$7.00 @ \$7.50
Morrill's No. 1, \$15.00
Nos. 3 and 4, Cross Cut, \$20.00
No. 5, Mill, \$30.00
Nos. 10, 11, 85, \$10.00
No. 1 Old Style, \$16.25
Special, \$16.25
Royal, Hand, \$3.50
Seymour Smith & Son's, \$6.75
Taintor Positive, \$6.75

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, \$1.50
Mounted Kitchen Sand Stone, \$1.50
Natural Grit Carving Knife Hones, \$3.00
Quick Cut Emery Carving Knife Hones, \$1.50
Quick Edge Pocket Knife Hones, \$2.50

Lawn Mower—

Pike Mfg. Co., 12, 14, 16, 18 and 21 in., doz., \$6.00, 33 1/4%

Shavers, Beef—

Enterprise Mfg. Co. 25 @ 30%

Shaves, Spoke—

Iron, doz. \$1.25
Wood, doz. \$2.00
Chapin-Stephens Co., 30 @ 30 & 10%
Millers Falls Co., \$1.00 @ 1.50
Seymour Smith & Son's, 50%

Shears—

Cast Iron, 7 8 9 in.
Best, \$16.00 18.00 20.00 gro.
Good, \$13.00 15.00 17.00 gro.
Cheap, \$5.00 6.00 7.00 gro.
Straight Trimmers, &c., Best quality Jap., 70 @ 10 & 5%
Best quality Nickel, 60 @ 10 & 5%
Tailors' Shears, 40 @ 40 1/2¢
Acme Cast Shears, 10%
Columbian Cutlery Co., Sheep, 1900 Hist., 30 @ 10 & 5%
Grass, 50 @ 10%
Horse or Mule, 50 @ 10%
W. H. Compton Shear Co.: Japan Handles, Nickel Blades, Full Nickel, 60 @ 10 & 5%
Tailors', 30%
J. Wiss & Sons Co.: Best Quality Jap'd, 60 @ 10%
Best Quality Nickeled, 50 @ 10%
Tailors', 25%

Tinners' Snips—

Steel Blades, 20 @ 20 & 10%
Steel Laid Blades, 50 @ 10%
Acme Cast Snips, 40%
W. H. Compton Shear Co., Forged Steel Handles, 35%
Jennings & Griffin Mfg. Co.'s 6 1/2 to 10 in., 33 1/2 @ 35%
Niagara Snips, 40%
P. S. & W. Forged Handles, 25%
Forged Handles, Steel Blades, Samson, 40 @ 40 & 5%
Triumph Store Pipe, doz., \$6.00
J. Wiss & Sons Co., Wiss Forged Steel, 25%

Pruning Shears—

Columbian Cutlery Co.: Hedge, Wilent Brand, 60 @ 10%
Lawn and Border, Wilent Brand, 60 @ 10%
W. H. Compton Shear Co., Dropped Forged Steel, 35%
Cronk's Hand Shears, 33 1/2%
Cronk's Wood Handle Shears, 33 1/2%
Disston's Combined Pruning Hook and Saw, \$7.00 @ \$7.50
Disston's Pruning Hook only, \$12.00, 25%
J. T. Henry Mfg. Co.: Pruning Shears, all grades, 40%
P. S. & W. Co., 40%
Seymour Smith & Son's: Hand Shears, 70%
Standard Tree Pruners, 75 @ 10%
Wood Handle Pruning Shears, 40%

Sheaves—Sliding Door—

Reading, 40%
R. & E. List, 15%

Sliding Shutter—

Reading, 40%
R. & E. List, 15%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge, 60 @ 5%
Club, Rival, 65 @ 5%; First Quality, 60 @ 5%

Paper Shells, Empty—

New Rapid, 10, 12, 16 and 20 gauge:
Climax, 10 and 12 gauge; Arrow, 10, 12, 16 and 20 gauge; Leader grade, 25 @ 5%
New Club, 10 and 12 gauge, Rival Grade, 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge, 20%
Nitro Club, 10, 12, 16 and 20 gauge: New Club, 14, 16 and 20 gauge; Repeater Grade, 20%

Shells, Loaded—

Loaded with Black Powder, 40%
Loaded with Smokeless Powder, medium grade, 40 @ 5%
Loaded with

Stocks and Dies—

Blacksmiths'.....	50@50.10%
Curtis Rev'ble Ratchet Die Stock.....	25%
Derby Screw Plates.....	25%
Green River.....	25%
Lightning Screw Plate.....	25%
Little Giant.....	25%
Reece's New Screw Plate.....	25%

Stoners, Cherry—

Enterprise.....	25@30%
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Stones, Axe—

Pike Mfg. Co., Axe Stones (all kinds).....	33 1/2%
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Glass Cutters' Stones—

Pike Mfg. Co., Glass Cutters' Stones and Supplies.....	40%
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Stones, Oil, &c.—

Pike Mfg. Co., 1907 list:	
Arkansas St. No. 1, 3 to 5 in. 2.50	
Arkansas St. No. 1, 5 1/2 to 8 in. 3.50	
Arkansas Slips No. 1.....	\$1.00
Lily White Washita, 4 to 8 in. 60c	
Rosy Red Washita, 4 to 8 in. 60c	
Washita St., Extra, 4 to 8 in. 50c	
Washita St., No. 1, 4 to 8 in. 40c	
Washita St., No. 2, 4 to 8 in. 25c	
Lily White Slips.....	90c
Rosy Red Slips.....	90c
Washita Slips, Extra.....	90c
Washita Slips, No. 1.....	70c
Washita Slips, No. 2.....	40c
India Oil Stones (entire list).....	33 1/2%
Quickcut Emery and Corundum Oil Stone, Double Grit.....	40%
Quickcut Emery and Corundum Axe Stone, Double Grit.....	33 1/2%
Quickcut Emery Rubbing Bricks.....	40%
Hindustan No. 1, Regular, 2 lb. 50c	
Hindustan No. 1, Small, 1 lb. 10c	
Turkey Oil Stones, Extra, 5 to 8 in. 80c	
Queer Creek Stones, 4 to 8 in. 20c	
Queer Creek Slips.....	10c
Hand Stone.....	6c

Scythe Stones—

Pike Mfg. Co., 1907 list:	
Black Diamond S. S. 2 gro. \$12.30	
Lamotte S. S. 2 gro. \$11.00	
White Mountain S. S. 2 gro. \$10.50	
Green Mountain S. S. 2 gro. \$7.00	
Extra Indian Pond S. S. 2 gro. \$8.00	
No. 1 Indian Pond S. S. 2 gro. \$7.50	
No. 2 Indian Pond S. S. 2 gro. \$5.00	
Leader Red End S. S. 2 gro. \$5.00	
Quick Cut Emery.....	2 gro. \$18.00
Pure Corundum.....	2 gro. \$18.00
Prescent.....	2 gro. \$7.00
Emery Scythe Rifles, 2 Coat.....	\$8.80
Emery Scythe Rifles, 3 Coat.....	\$11.00
Emery Scythe Rifles, 4 Coat.....	\$13.20
Balance of 1907 list 33 1/2%	
Lectro (Artificial), 2 gro. \$12.00	
Lightning (Artificial), 2 gro. \$12.00	
Artificial, 2 gro. \$18.00	

Stoppers, Bottle—

Victor Bottle Stoppers.....	2 gro. \$9.00
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Stops—Bench—

Millers Falls.....	15@10%
Morrill's, No. 1.....	\$10.00
Morrill's, No. 2.....	\$12.50
Seymour Smith & Son's.....	00%

Door—

Chapin-Stephens Co.....	50@50.10%
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Plane—

Chapin-Stevens Co.....	20%
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Straps—Box—

Acme Embossed, case lots.....	20@10.10%
Cary's Universal, case lots.....	20@10.10%

Stoppers, Razor—

Pullman Safety Razor Blade, doz.....	\$8.50
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Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses.....	25@25.72%
P. S. & W. Co.....	40@10.5%

Swings, Lawn—

Myers' Low Down Roller.....	\$6.25
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Tacks, Finishing Nails, &c.

American Carpet Tacks.....	90@50c
American Cut Tacks.....	90@25c
Succede' Cut Tacks.....	90@30c
Succede' Upholsterers'.....	90@35c
Gimp Tacks.....	90@15c
Lace Tacks.....	90@35c
Trimmers' Tacks.....	90@30c
Looking Glass Tacks.....	60c
Bill Posters' and Railroad Tacks.....	90@100c
Hungarian Nails.....	80c
Finishing Nails.....	70c
Trunk and Clout Nails.....	75@50c

NOTE—The above prices are for straight weights.

Double Pointed—

Double Pointed Tacks.....	90@6 tens@—%
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Tapes, Measuring—

American Asses' Skin.....	50@—%
Patent Leather.....	25@30.5%
Steel.....	33 1/2@5%
Chesterman's.....	25@25.5%
Keuffel & Esser Co.: Favorite, Ass Skin.....	40@10.50%
Favorite, Duck and Leather.....	25@25.10%
Metallic and Steel, lower list, 35@ 35.5%; Pocket, 35@35.5%.	

Lufkins:

Asses' Skin.....	40@10.50%
Metallic.....	30@30.5%
Patent Bend, Leather.....	25@25.10%
Pocket.....	40@40.5%
Steel.....	33 1/2@33%

Wichsch & Hilger:

Chesterman's Metallic, No. 3M.....	25%
Chesterman's Steel, No. 100L.....	25%
etc.....	35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 5/8-inch and larger per 100 lb.....	\$2.55 @ \$2.80
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Thermometers—

Tin Case, Cabinet, Plunger, Dairy, &c.....	30@35%
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Ties, Bale—Steel Wire—

Single Loop.....	82 1/2@10%
Monitor, Cross Head.....	82 1/2@10%

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.	
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Tops, Chimney—

Iwan Volcano Chimney Tops.....	55%
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Tools—Coopers'—

L. & I. J. White.....	20@20.5%
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Ice Tools—

Gifford-Wood Co.....	15%
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Saw—

Atkins' Cross Cut Saw Tools.....	35%
Simonds' Improved.....	35%
Simonds' Crescent.....	35%

Ship—

L. & I. J. White.....	25%
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Torches—

Hammers, Engine, 2 doz.....	\$1.50
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Traps—Fly—

Balloon, Globe or Acme, doz.....	\$1.50 @ \$1.25
Simonds' Improved.....	\$1.10 @ \$1.00
Harper, Champion or Paragon, doz.....	\$1.25 @ \$1.10; gro. \$1.50 @ \$1.35

Game—

Imitation Oneida.....	75@10%
Newhouse.....	50@5%
Hawley & Norton.....	65@10%
Victor.....	75@10%
Oneida Community Jump.....	70@5%
Top Thief.....	60%
Tree Trap.....	60%
Hector.....	75@10%

Mouse and Rat—

Mouse, Wood, Choker, doz, holes, 12c	
Mouse, Round or Square Wire, doz.....	85@90c

Trowels—

Disston Brick and Pointing.....	25%
Disston Plastering.....	20%
Disston "Standard Brand" and Garden Trowels.....	30%
Kohler's Steel Garden Trowels, 2 gro., 5 in., \$1.50; 6 in., \$6.00.	
Never-Break, Forged Steel Garden Trowels, in 1 doz. boxes, gro. \$6.50	
Woodrough & McFarlin, Plastering.....	25%

Trucks, Warehouse, &c.—

McKinney Trucks.....each, net \$10.00	
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Tubs, Wash—

No. 0 1 2 3	
Mfr's list, price per gross, subject to discount of 10@7 1/2@5@5 @10.5%	
Galvanized.....	\$67 \$79 \$91 \$103

Twine, Miscellaneous—

Flax Twine:	
No. 9, 1/4 and 1/2 lb. Balls.....	21@23c
No. 12, 1/4 and 1/2 lb. Balls.....	19@21c
No. 18, 1/4 and 1/2 lb. Balls.....	16@18c
No. 24, 1/4 and 1/2 lb. Balls.....	15 1/2@17 1/2c
No. 36, 1/4 and 1/2 lb. Balls.....	15@17c
Chalk Line, Cotton 1/4 lb. Balls.....	24@26c
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....	8 1/2@21c
Cotton Wrapping, 5 Balls to lb., according to quality.....	13 1/2@21c
American 3-Ply Hemp, 1 and 1 1/2 lb. Balls.....	10 1/2@11c
American 3-Ply Hemp, 1-lb. Balls.....	13 1/2@16c
India, 3-Ply Hemp, 1-lb. Balls.....	7 1/2@9c
India 3-Ply Hemp, 1-lb. Balls.....	7 1/2@9c
2, 3, 4 and 5-Ply Jute, 1 1/2 lb. Balls.....	9@11c
Mason Line, Linen, 1/4 lb. Balls.....	17c
No. 203 Mattress, 1/4 and 1/2 lb. Balls, according to quality.....	30@60c
Wool, 3 to 6 ply.....	B 6c; A 7 1/2c

Vises—

Solid Box.....	60@60.10%
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Parallel—

Fisher & Norris Double Screw Leg, each, Nos. 2 \$10.50; 3 \$16.00; 4 \$20.50; 5 \$27.00; 6 \$32.00.....	23%
Fisher-Brooks Bench and Woodworkers' Vises, No. 0, \$3.80; No. 1, \$3.90; No. 2, \$8.25; No. 3, \$10.50; No. 4, \$13.50.....	40%
Merrill's.....	45%
Millers Falls Oval Slide Pattern.....	60@10%
Parker's:	
Victor, 20@25%; Regulars.....	20@25%
Vulcan's.....	43@17%
Combination Pipe.....	55@60%
Prentiss Vice Co.:	
Patent, Bicycle, Shepard, Gipsy, Adj. Column, Lewis Adj. Jaw.....	25%
Rapid Transit, Heavy Chipping.....	30%
Bull Dog, Anchor Line, Yankee Quick Lever, Lewis Solid Jaw, Eclipse Wrench Attachment.....	40%
Monarch.....	45%
Vise Jaw Cuts.....	10%
Pullman Automatic Bench, 2 doz., No. 1, \$7.50; No. 2.....	\$9.50

Pipe—

Curtis & Curtis Malleable.....	25%
Parker's Combination:	
87 Series, 60%; 187 Series, 60@5%; No. 870, 40%.	
Prentiss Vice Co.:	
Black Combination, Prentiss Combination, Prentiss.....	60%
Malleable; Monarch Combination.....	65%
Rex Combination.....	70%
Peerless Pipe Grip.....	25%

Saw Filers

Disston's D 3 Clamp and Guide, 2 doz., \$24.00, 30%; Clamps.....	30%
Reading.....	50@10%

Wood Workers—

Prentiss Cabinet Makers'.....	40%
Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.	

Wads—Price per M.

B. E., 11 up.....	50c
B. E., 9 and 10.....	70c
B. E., 8.....	80c
B. E., 7.....	80c
P. E., 11 up.....	\$1.00
P. E., 9 and 10.....	1.25
P. E., 8.....	1.50
P. E., 7.....	1.50
Ely's B. E., 11 and larger.....	1.75
Ely's P. E., 12 to 20.....	\$5.00 @ 1.25

Ware, Hollow—

Cast Iron, Hollow—

Store Hollow Ware:	
Enameled.....	45@10%
Ground.....	50@5%
Plain or Unground.....	60%
Country Hollow Ware, per 100 lbs.....	\$2.75 @ \$3.00

White Enameled Ware:

Maslin Kettles.....	65@10%
Covered Vases.....	65@10%
Tinned and Turned.....	55@10%
Enameled.....	45@10%

See also Pots, Glus.

Enameled—

Agate Nickel Steel Ware.....	33 1/2%
El-an-ge.....	60@10%
Iron Clad Ware.....	70@10%
Lava and Volcanic, Enameled.....	40@10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	6 7 8 9
Each.....	45c 50c 55c 65c

Steel Hollow Ware—

Avery Stamping Co.:	
Never-Break Spiders and Grids.....	65@10%
Steel Kettles, Maslin Scotch Bowls, Tinned.....	60%
Steel Stew Pans, Stew Pots, etc., Porcelainized.....	50%
Cleveland Stamping & Tool Co.:	
Solid Steel Spiders and Grids.....	65@5%
Solid Steel Kettles.....	60@5%

Warmers, Foot—

Pike Mfg. Co., Soapstone.....	40@40.10%
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Washboards—

No. 800—Brass King, Single Surface, Open Back.....	\$3.00
801—Brass King, Single Surface, Open Back.....	\$2.50
802—Brass Junior, Single Surface, Open Back.....	\$2.25
803—White Hen, Spiral Crimp Glass.....	\$3.15
804—Royal Blue Enamel, Single Surface, Ventilated Back.....	\$3.25
172—Our Best, Single Zinc, Soap Drainer.....	\$3.25
722—Soap Saver, Single Zinc, Iron.....	\$3.35
100—Northern, Single Zinc, Perforated, Open Back.....	\$3.00
134—Universal, Single Zinc, Extra Family Size, Ventilated Back.....	\$2.80
710—Regal, Single Zinc, Extra Family Size, Ventilated Back.....	\$2.50
701—Pioneer Globe, Single Zinc, Ventilated Back.....	\$2.25
57—Peerless, Double Zinc, Spring Protector.....	\$3.70
56—Red Cross, Double Zinc, Swing Protector.....	\$3.60
17—North Star, Solid Zinc, Swing Protector.....	\$3.00
79—Jewel, Single Zinc, Full Size.....	\$1.25

Washers—Leather, Axle—

Solid.....	90@90.10%
Patent.....	90@90.5%
Coll: 1/4 1 1 1/4 1 1/4 inch.	
9c 10c 11c 14c per doz.	

Iron or Steel—

Size bolt.....	5-16 3/4 1 1/2 2 3/4
Washers.....	5-16 3/4 1 1/2 2 3/4

The above prices are based on \$6.50 off list.
In lots less than one keg add 1/4c per lb.; 5-lb. boxes add 1/4c to list.

Avery Stamping Co.:

Standard, in 200 lb. kegs, \$6.00 3/4	
100 lb. dist.; in 100 lb. kegs add 10c net 3/4 100 lb.; in 5 or 10 lb. boxes, add 50c net 3/4 100 lb.; in 1 lb. boxes, add \$1.00 net 3/4 100 lb.	

Cast Washers—

Over 1/2-inch, barrel lots, per lb. 1 1/2 @ 1 3/4c	
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Wedges—

Oil Finish.....	1b., 2 1/4 @ 2 3/4c
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Weights—Hitching—

Covert Mfg. Co.....	25%
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Sash—

Per net ton.....	\$21.00 @ \$21.00
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Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65% Emery.....	75%
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Well—

8-in., \$2.00; 10-in., \$2.30; 12-in., \$3.00; 14-in., \$4.45.	
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Wire and Wire Goods—

Market and Stone Wire in Bundles—

Bright and Annealed:	
9 and coarser.....	80%
10 to 18.....	80@10%
19 to 26.....	80@10.25%
27 to 36.....	80@5%
Galvanized:	
9 and coarser.....	75@10%
10 to 16.....	75@10%
17 to 26.....	72 1/2@10%
27 to 36.....	72 1/2%
Coppered:	
9 and coarser.....	75@10%
10 to 26.....	75@10%
27 to 36.....	70@10.5%
Tinned:	
6 to 18.....	75@10.10%
Brass.....	15c lb., base
Copper.....	17 1

